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by

Charles M. Urban and Karl J. Springer

Southwest Research Institute
8500 Culebra Road
San Antonio, Texas 78284

Contract No. 68-03-2147

EPA Project Officers: John C. Shelton and Fred Dindoffer

Prepared for

ENVIRONMENTAL PROTECTION AGENCY
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Office of Mobile Source Air Pollution Control
Emission Control Technology Division
Ann Arbor, Michigan 48105

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ABSTRACT

In this project, exhaust emissions data were obtained from heavy-duty vehicles operated on chassis dynamometers. A total of 32 vehicles were evaluated, ranging from 7700 kg (17,000 lbs) to 33,000 kg (73,000 lbs) gross vehicle weight (GVW). The vehicles included eighteen gasoline trucks (or truck-tractors), twelve diesel trucks (or truck-tractors) and two diesel buses. The evaluations involved an on-the-road determination for setting dynamometer power and the evaluation on chassis dynamometers of several steady state, sinusoidal and driving cycle operating conditions. Chassis version nine-mode or thirteen-mode evaluations were conducted as appropriate on all vehicles. Each of the vehicles were evaluated at three different inertia weights and dynamometer road-load settings to simulate an empty vehicle, half payload, and full rated GVW. On two gasoline and two diesel vehicles, the entire emissions test sequence was repeated and determinations were made using alternate driving cycles. Results are summarized by truck for each test method.

FOREWORD

This project was initiated by the Mobile Source Air Pollution Control Branch, Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105. The engineering effort on which this report is based was accomplished by the Department of Emissions Research of Southwest Research Institute, 8500 Culebra Road, San Antonio, Texas. This project, authorized by Contract 68-03-2147, began on November 15, 1974 and was completed June 8, 1976.

The SwRI Project Leader was Mr. Charles Urban who supervised all work conducted in this project. The Lead Technician on this project was Mr. Robert Howard, who served in this function throughout the project. Mr. Karl Springer was Project Manager and was primarily responsible for the technical and fiscal negotiation of the initial project and the subsequent modification and Task Order.

The Project Officer throughout the evaluation of the gasoline trucks was Mr. Fred Dindoffer of the Mobile Source Air Pollution Control Branch, Environmental Protection Agency. The Project Officer throughout the evaluations of diesel trucks was Mr. John Shelton. A Task Order addition, under Contract 68-03-2196, to evaluate two diesel buses, was under the direction of Mr. Chester France. Other individuals at EPA who provided input or were otherwise closely associated with some aspects of the project include: Mr. Gary Rossow and Ms. Marcia Williams. This project was identified within Southwest Research Institute as No. 11-4133-001. The Task Order for evaluating the two buses was identified as 11-4291-005.

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I. INTRODUCTION

This is another in a series of reports concerning emissions from engines used to power trucks and buses above 2122 kg (6000 lbs) gross vehicle weight (GVW). These reports(1-12)* cover work begun at Southwest Research Institute in 1967 on behalf of the Environmental Protection Agency (formerly the National Air Pollution Control Administration of HEW). This report describes the evaluations of emissions and fuel consumption from gasoline and diesel powered vehicles of greater than 4536 kg (10,000 lbs) GVW.

A. Project Objective

The objective of this project was to obtain exhaust emissions data from heavy duty vehicles operated on chassis dynamometers. In this project, a total of 32 vehicles were evaluated; ranging from 7711 kg (17,000 lbs) to 33,112 kg (73,000 lbs) GVW. The vehicles included eighteen gasoline trucks (or truck tractors), twelve diesel trucks (or truck-tractors) and two diesel buses. The evaluations involved an on-the-road determination for the setting of dynamometer power and the evaluation on chassis dynamometers of steady state, sinusoidal and driving cycle operating conditions.

B. Project Plan of Performance

The initial project required eight different steady state, three sinusoidal and four driving cycle evaluations at each of three road-load conditions for each of thirty vehicles. In addition, continuous (i.e., data obtained every second) data tapes were to be made of all sinusoidal and transient driving cycle evaluations. A subsequent contract modification added chassis version nine-mode evaluations of the eighteen gasoline trucks, three additional sinusoidal evaluations on six gasoline trucks and partial processing of all the data tapes. A subsequent Task Order added the evaluation of two diesel buses. For the buses, one steady state and one sinusoidal evaluation were deleted.

The contract on which this report is based did not allow for analysis of the data. Work on a separate contract (68-03-2220) for analysis of this data is currently in process and will be reported the latter part of this year. This data analysis contract also includes final processing of the continuous data tapes.

C. EMA Involvement

With EPA approval, the Engine Manufacturers Association (EMA) funded the conductance of chassis version thirteen-mode

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*Superscript numbers in parentheses refer to the List of References at the end of this report.

evaluations on the twelve diesel trucks. The results of these evaluations are briefly summarized in this report.

D. Project Reviews

A number of meetings, discussions, and status reviews were held during the course of this project with the Project Officers and the other individuals at EPA involved in this project. Monthly progress, letter, and telephone reports were issued or made to keep the Project Officer informed on the project's progress or problems.

II. EQUIPMENT, INSTRUMENTS, PREPARATIONS AND PROCEDURES

This section contains a brief description of the instruments, equipment, facilities, preparations and procedures used to conduct this project. The chassis dynamometer facility, the Metrodata recorder, and the Labeco 5th wheel were essentially the only items used with both the gasoline and the diesel trucks.

A. Chassis Dynamometers

Two chassis dynamometers were used in this project. The dynamometer used for the nine-mode tests on the gasoline trucks was a Clayton CT-200 with 200 hp absorbing capability. To this was connected a 50 hp electric motor which, by means of gear belt drive, could provide the constant 2000± 100 rpm engine speed required for the test. A similar dynamometer, except without the 50 hp electric motor, was used for the 13-mode tests on the diesel trucks. Both dynamometers were used in conducting the other evaluations. The Clayton water brake dynamometers used in this project are similar to and have similar road load characteristics to those used in the car size dynamometer for 1975 light duty testing.

One of the dynamometers used during the transient driving tests is shown in the upper views in Figure 1. The upper left photo also shows the Labeco 5th wheel which was used for measuring speed and distance traveled over the road and on the chassis dynamometer. The left middle photo shows one of many inertia wheel combinations used to simulate the weight of the vehicle. In addition, this photo shows the railroad car brake shoes which were used to provide the additional braking capacity necessary for operation of vehicles over 7250 kg (16,000 lbs). These wheels were direct connected to a Clayton water brake dynamometer with 219mm (8.625 inch) diameter rolls. The right middle photo shows the driver aid chart recorder being readied for driving a transient cycle. The two lower photos show the chain securing the truck on the dynamometer and the added weight, in the form of concrete blocks or drums of water, required to minimize wheel slippage.

As shown in Table 1, a wide range of inertia wheel combinations are available for evaluation of vehicles on the chassis dynamometer. Additional combinations are obtainable above 4000 kg, but are not as readily available as those shown.

B. Exhaust Sampling and Analysis

Two different exhaust sampling techniques and sets of instrumentation were used in this project. One system was used for evaluating

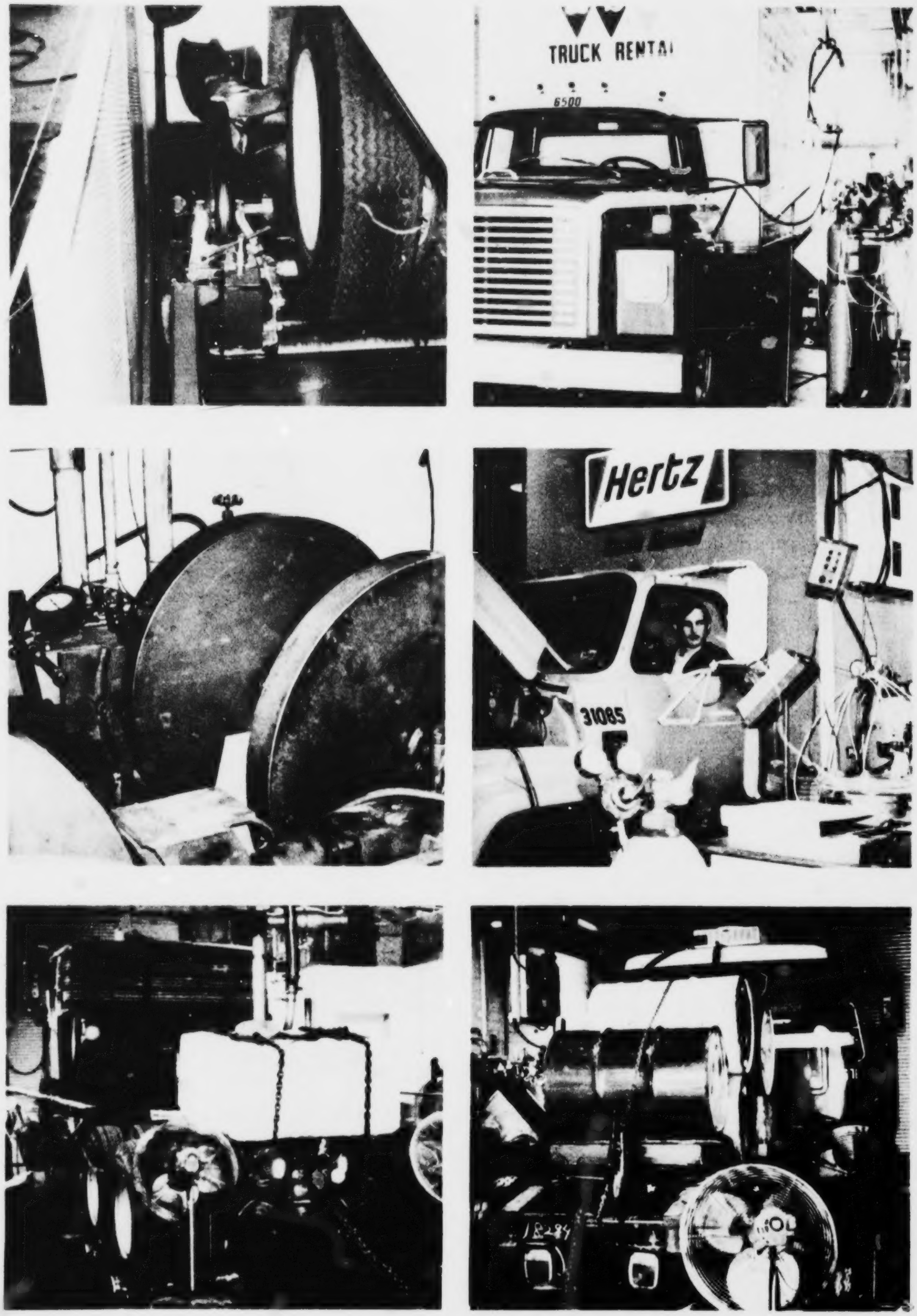


FIGURE 1. VEHICLE CHASSIS DYNAMOMETER ARRANGEMENTS

TABLE 1. INERTIA CAPABILITIES OF
SwRI MEDIUM-HEAVY DUTY CHASSIS DYNAMOMETERS

SINGLE DRIVE AXLE

Inertia Simulation (kg)	Use Wheel Numbers
Unit #1	
454	1
590	2
771	2,5
907	2,6
1,043	2,1
1.088	2,5,6
1.225	2,5,1
1,361	2,6,1
1,542	2,5,6,1
1,742	2,3
1.905	2,3,5
2,041	2,3,6
2,177	2,3,1
2,223	2,3,5,6
2,359	2,3,5,1
2,495	2,3,6,1
2,676	2,3,5,6,1
3,402	2,3,4
3,583	2,3,4,5
3,719	2,3,4,6
3,856	2,3,4,1
3,901	2,3,4,5,6
4,037	2,3,4,5,1
4,173	2,3,4,6,1
4,354	2,3,4,5,6,1
5,080	2,3,4,7
5,262	2,3,4,7,5
5,398	2,3,4,7,6
5,534	2,3,4,7,1
5,579	2,3,4,7,5,6
5,715	2,3,4,7,5,1
5,851	2,3,4,7,6,1

SINGLE DRIVE AXLE

Inertia Simulation (kg)	Use Wheel Numbers
Unit # 2	
3,856	9
5,216	3, 9
7,257	16
9,072 or	3, 9, 9 or
12,474	3, 9, 16 **
11,113	16, 9
18,370	16, 916

TANDEM DRIVE AXLES

Inertia Simulation (kg)	Use Wheel Numbers
Unit #2*	
3,856	9-0
7,257	0-16
11,113	9-16
18,370	9,16-16
22,226	9,16-16,9
26,081	9,16,9-16,9
33,339	9,16,9-16,9,16

* Other combinations obtainable by changing one or more wheels.
** Obtainable in a few hours by changing out one wheel.

the gasoline trucks and the other for evaluating the diesel trucks and buses.

1. System for Gasoline Trucks

The Federal Light Duty Test Procedure for cars (below 6000 lbs GVW) powered by gasoline and diesel engines involves transient operation during which the exhaust is diluted by means of a constant volume sampler (CVS). In this project, a two-speed truck-size CVS, with nominal 17 to 25 m^3/min (600/900 SCFM) flow capacity was used to acquire dilute samples from the gasoline powered trucks. With some of the larger engines at high power output, however, this CVS capacity was marginal. In addition to the bagged samples, the exhaust emissions and operating parameters were recorded continuously on a strip chart recorder.

The upper photographs of Figure 2 show the analytical system for obtaining and measuring the diluted CVS samples. In the upper left photo, the Metrodata recording system is on the left side of the picture. This analytical cart and the constant volume sampler were prepared, calibrated, and used in accordance with the appropriate Federal specifications and regulations given in reference 13. The center photo shows the backside of the emissions instrumentation and the numerous calibration gas bottles. The lower left photo shows the Metrodata recording system and lower right photo shows the Beckman Model 590 HC/CO Tester which was used for measuring the raw exhaust during idle.

Nominal full-scale for the emissions and other instrumentation during transient tests were as follows:

HC by FID - 5000 ppm
CO by NDIR - 2 percent
CO_2 by NDIR - 5 percent
NO_x by CL - 1000 ppm
VEHICLE SPEED - 96.56 km/hr (60 mph)
ENGINE SPEED - 4000 rpm
MAN. VAC. - 762 mm (30 inches) Hg
CVS TEMP. - 185°C (365°F)

Each of the emissions instruments had variable ranges and the appropriate range was selected for reading the bagged samples. The output of each instrument was fed into strip-chart recorders and a Metrodata tape recording system. The bagged or modal values for each test were transferred to computer cards for processing.

The Metrodata recording system recorded the meter reading of each parameter every 0.2 seconds for 4.2 seconds, after which an

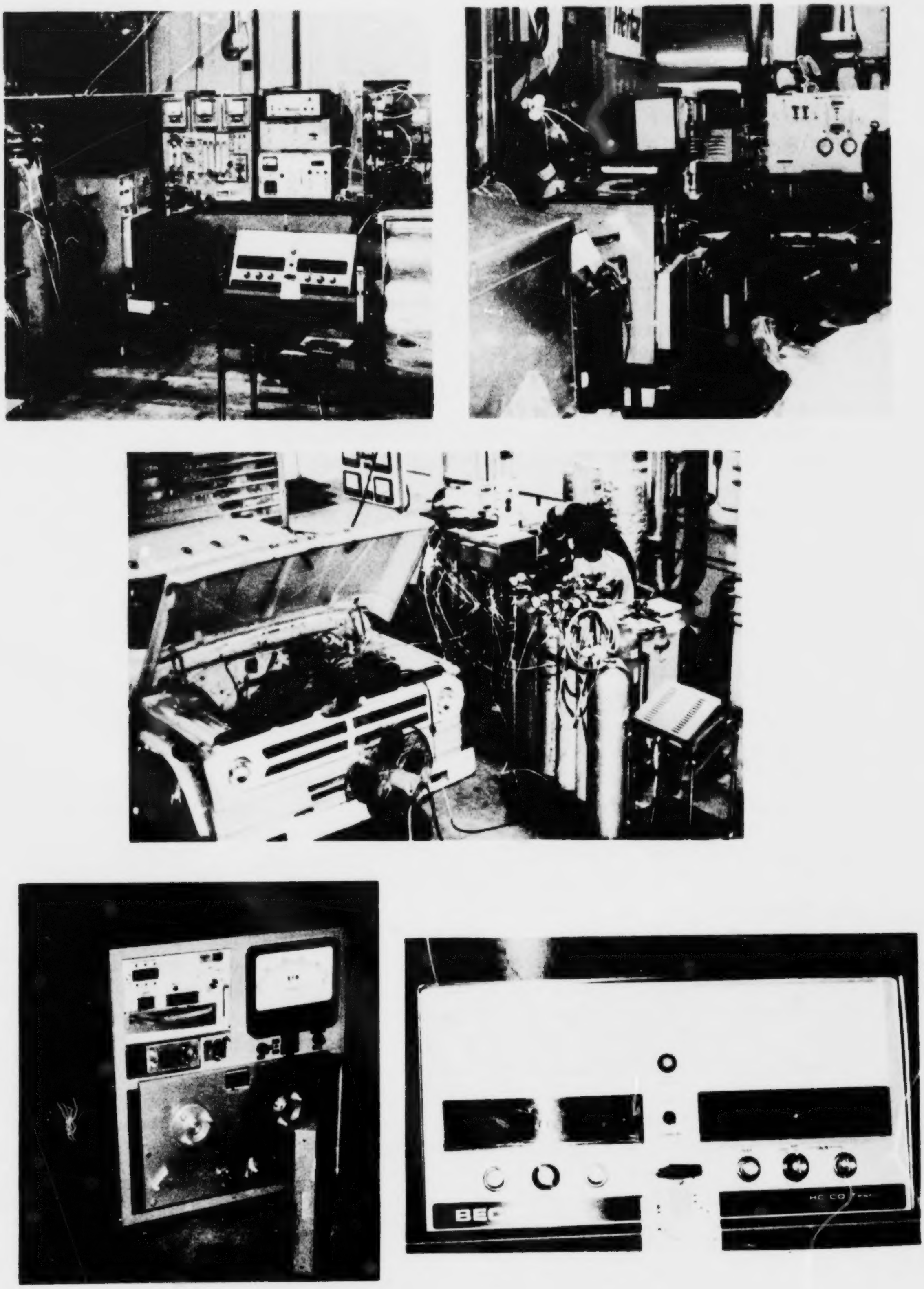


FIGURE 2. EXHAUST EMISSION INSTRUMENTATION

approximate 0.4 second gap occurred prior to the next set of readings. The Metrodata recording format is given in Table 2. Initially, no processing of the Metrodata tapes was included in the project. Subsequent modification to the contract, along with a separate data analysis contract, required processing of the tapes. This processing was accomplished using an Institute-owned Hewlett-Packard 2100 A computer system.

2. System for Diesel Trucks and Buses

Since a number of the diesel units would exceed the capacity of the CVS, continuous (every second) measurement of the undiluted exhaust was used for determination of emission rates. Continuous air flow measurement was determined and used along with the total carbon in calculating the emission rates. The rate in grams/minute was calculated from the Metrodata recording tapes by summing the rates for each second and dividing by the total cycle time. Fuel flow, except in the 13-mode evaluations, was calculated using carbon balance. Measurement of HC and CO during idle was attempted on the Beckman Model 590 HC/CO Tester. Generally, however, the HC and CO values were too low to obtain a readable value on the available ranges of this Tester.

The emissions instrumentation essentially followed the requirements in the recommended heavy duty gasoline and diesel instrumentation and test procedures[14, 15]. The primary difference between this recommended system and the current 13-mode instrumentation[13] is the use of a heated CL in place of the NDIR for measurement of oxides of nitrogen. The recommended system schematic is given as Figure 3. Since this project was performed under a rapid and stringent schedule, time did not permit reproducing this system exactly as shown. The only significant exception to the requirement in the recommended procedure was that the sample system for the CL used in this project was heated to 125°C rather than the specified 190°C. This is of no particular consequence, since the intent of the heated sample system is to eliminate the need for a water trap before the converter. This is adequately accomplished by the 125°C temperature. The FID sample system was heated to the specified 190°C. A Merriam Laminar Flowmeter was used to measure air flow.

Parameters recorded on the strip charts and the Metrodata tapes and the primary nominal full scale values used were as follows:

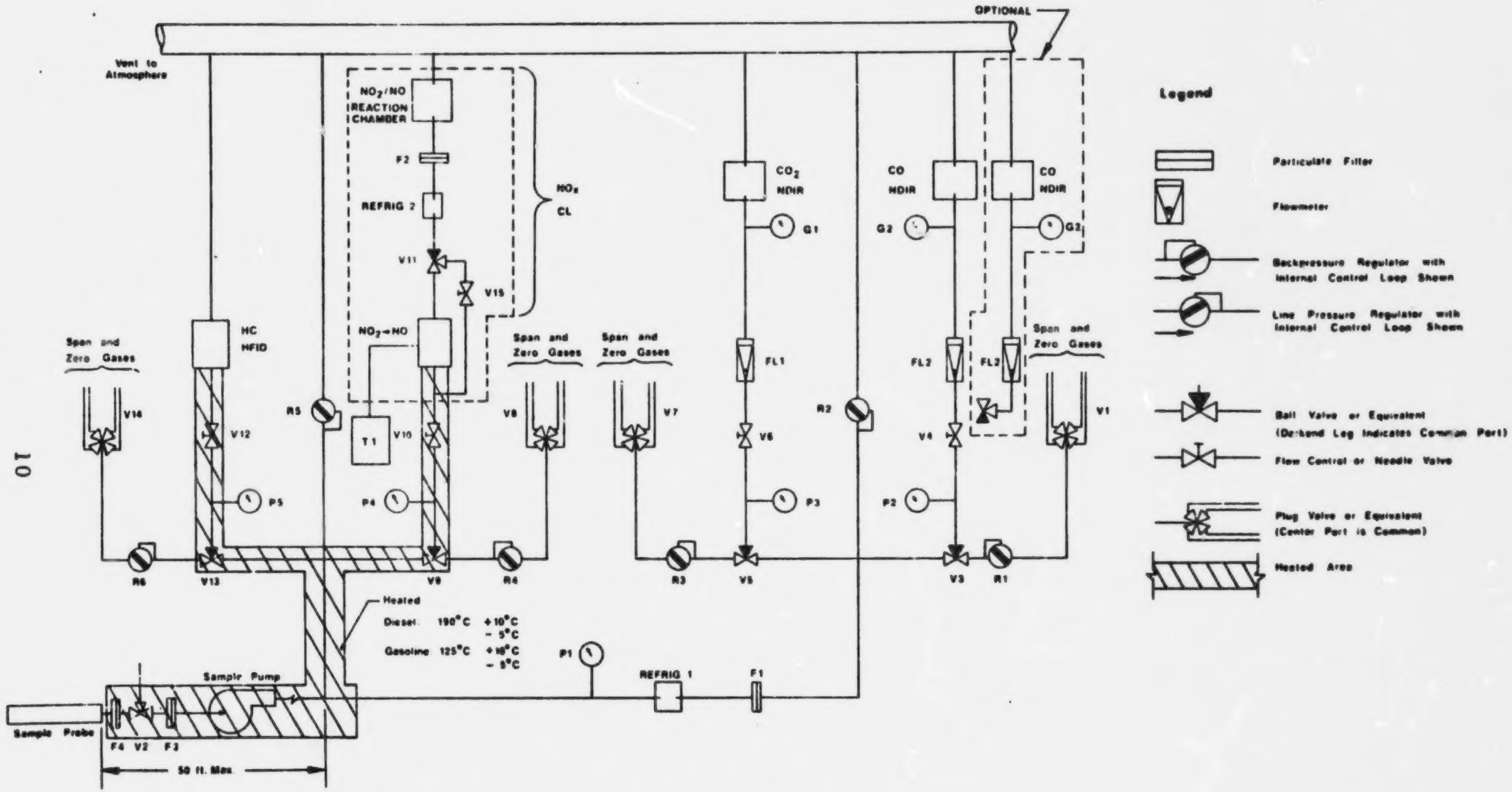
HC by FID - 400, 800 and 1600 ppm
CO by NDIR - 0.3, 0.8 and 2.0 percent
CO_2 by NDIR - 16 percent
NO_x by CL - 1000 and 2500 ppm
VEHICLE SPEED - 96.56 km/hr (60 mph)
ENGINE SPEED - 4000 rpm

TABLE 2.
DESCRIPTION OF METRODATA RECORDING FORMAT

```
                        Vac,                                                       Vac.,                                                  Vac,
                        Rack                                                       Rack                                                   Rack
                         or  Air                                                    or   Air                                               or   Air
Time Time  Mph  Rpm     Rail ΔP    CO   CO2   HC   NOx   Mph   Rpm     Rail ΔP     CO   CO2   HC   NOx   Test Temp
+162+002-001+159+000+208+008+123+130+052-008+146-001+208+005+120+129+048+341+116
●+162+002-008+127-001+217+008+123+131+052-003+131-012+205+009+121+131+047+341+11
6●+162+003-006+131+000+202+008+122+130+052-009+125+000+211+006+121+131+047+341+1
16●+162+003-004+129-015+210+010+122+132+052-003+144-009+202+008+120+130+047+341+
115●+162+003-009+136+006+206+007+122+131+052-008+132-009+206+008+120+131+047+341
+117●+162+004-002+126-009+211+010+122+132+052-005+133+000+208+006+120+130+048+34
1+115●+162+004-011+135-004+204+007+120+130+052-006+132-010+209+010+121+131+047+3
41+117●+162+005-001+135-006+205+010+121+131+052-007+144-003+204+006+119+129+048+
341+115●+162+005-010+131-001+213+008+121+131+052-004+123-007+208+009+120+130+047
+341+116●+162+006-004+139-010+199+010+122+131+052-009+136+000+209+006+121+129+04
8+341+116●
FILE NO. = 35  RECORD NO. =   2  LENGTH 405 WORDS
+162+006-008+133+002+203+008+120+130+052-009+124-001+210+007+120+130+047+341+117
●+162+007-003+128-017+208+012+122+131+052-004+138-002+205+008+120+129+048+341+11
5●+162+007-010+134+003+207+007+120+130+052-008+129-010+207+010+122+130+047+341+1
17●+162+008-001+124-008+209+012+121+131+051-006+133+000+205+006+120+129+048+341+
115●+162+008-011+132-006+205+007+120+130+052-005+131-010+208+010+120+129+047+341
+117●+162+008-002+133-003+207+009+121+130+052-008+139-002+205+005+120+128+048+34
1+116●+162+009-009+122-002+215+008+121+130+052-003+126-009+206+009+121+128+047+3
41+115●+162+009-005+141-008+198+010+120+129+052-009+137-001+210+007+121+128+047+
341+117●+162+010-005+129-007+215+011+121+131+052-003+141-011+201+009+120+128+048
+341+115●+162+010-009+132+004+204+007+121+130+052-008+123-003+212+009+120+130+04
7+341+117●
```

Notes:

1. ● = End of each column of twenty channels of data
2. RACK or RAIL and AIR ΔP used with diesel powered vehicles
3. All parameters are recorded as meter deflections with Full Scale = 1000
4. Time is in Hours, Minutes and Seconds (+HHM+MSS+)
5. Each Record of 405 words is ten scans of the twenty channels and requires 4.17 seconds.
6. Inter-record gap of 0.42 seconds between Records



Heavy Duty Exhaust Gas
Sampling and Analytical Train

FIGURE 3. RECOMMENDED EXHAUST GAS SYSTEM SCHEMATIC

AIR FLOW - 28.32 m^3/min (1000 CFM)
AIR TEMP. - Readable to 0.5°C
RACK - 100 percent
RAIL PRESSURE - 1379 kPa (200 psi)

During steady state and 13-mode evaluations, additional emissions ranges were used as necessary.

Every reasonable effort was made to keep the sample line lengths and the overall response times to the minimum possible. The total response times from change of engine operating parameter to maximum step change of the resultant emission measurement were as follows:

HC - 7 seconds
CO - 4 seconds
CO_2 - 3 seconds
NO_x - 8 seconds

The readily apparent limiting factor in the CL system was the converter. Further increase in flow rate through the converter beyond that employed had a drastic effect on converter efficiency.

3. The Chemiluminescence Instrument

In past projects using chemiluminescence, it had been occasionally noted that NO readings have been higher than NO_x under some operating conditions. Instability has also occurred on occasion. With the gasoline trucks in this project, the situation of NO higher than NO_x was found to occur at some operating conditions; primarily the extremely high power modes. However, due to the expressed time urgency in this project, no attempt was made to determine the frequency of or the reason for this occurrence. With the CL set up for the diesel operation, the NO was often higher than NO_x. Several evaluations were made in an attempt to determine the reason, but the cause could not be readily determined. Subsequently, the converter was steam cleaned, the flow rate was reduced, and a few minor instrument modifications were made which minimized but did not eliminate this occurrence.

This and other questions encountered with the CL instruments were discussed with an EPA representative on the CRC-APRAC-CAPI-1-64 Hydrocarbon, NO and CO Sub-panel. Subsequent contact indicated that the CRC sub-panel was involved in resolving these questions involving CL, prior to possible use of CL in future Federal heavy duty engine test procedures.

C. Related Support Facilities

The previous portions of this section have briefly described the

various instruments and equipment used in this project. Although the extent of instrumentation used may be impressive, the accuracy of the results is of major importance. This is where the long range policy of quality assurance, attention to detail, and concern about test data reliability that has been the goal of the Emissions Research Department was invaluable.

For example, to maintain and perform the specified calibrations, as required by contract or the applicable Federal Registers, was immense given the number and variety of tests involved. Every instrument, dynamometer, CVS, pressure gauge, temperature read-out, etc., was periodically calibrated according to EPA or SwRI procedures. Gases for NDIR, FID, and CL instrument span were named from SwRI "golden standard" gases which were named by EPA. These "golden standard" gases also formed the basis for the primary instrument calibrations.

There are numerous other examples of the support of this project in terms of daily, weekly, and monthly checks, spans, and calibrations. Every reasonable attempt was made to obtain factual evidence on the emissions and vehicle operation throughout the project.

D. Vehicles

In all, a total of 32 vehicles were evaluated in this project. Included were 18 gasoline and 12 diesel trucks or truck-tractors and 2 diesel buses. Due to the extended length of time required to complete the evaluations on a vehicle (from one to two weeks), most vehicles were obtained from rental or leasing companies. Vehicles which could not be obtained with the desired engines from the rental and leasing companies had to be obtained from various other companies or individuals. Keeping a project of this type supplied with vehicles is among the more difficult and time-consuming tasks involved.

Neither population or sales data were available on specific engine models used in the over 4,536 kg (10,000 lbs) GVW trucks specified in this project. Therefore, the tentative selection of truck engines relied heavily on selections found acceptable in previous projects. The primary criteria used with respect to gasoline engines was that Diamond Reo should have a maximum of one engine, Dodge should have about 10 percent, and the remainder should be made up with approximately equal representation of General Motors, Ford, and International Harvester. General Motors' portion in turn would be about equally represented by Chevrolet and GM Truck and Coach Division. In addition, no engine model, regardless of popularity, was to occur more than three times in the trucks finally selected. Taking into account the available sales data for diesel engines, it was initially planned for Cummins and Detroit Diesel to each represent

between 30 and 40 percent and the remainder to be made up of Mack, Caterpillar, and possibly Mercedes.

In addition to the requirement to evaluate a representative mix of engines, the following mix of vehicle types were specified:

No. of Axles	Fuel Type	No. of Trucks: Pre 1970	1970 to 1973	Pre 1974	74 & Later	1975 Calif.	Total Number of Vehicles
2 SU	Gasoline	2	2		4	1	
3 SU	Gasoline	1	1		2		
TT	Gasoline	1	1		2	1	18 Trucks
2 SU	Diesel			1	1		
3 SU	Diesel			1	1		
TT	Diesel			4	3	1	12 Trucks
2 BUS	Diesel			1	1		2 Buses
							32 Total

SU - Single unit
TT - Tractor trailer

Of the two diesel buses, one was to be for city and the other for highway use.

A tentative list of 30 trucks, based on the preceding requirements, was made up and was approved by the EPA Project Officer. As in other projects of this type, however, the final specific selections were to a large extent controlled by availability. The resultant vehicles evaluated in this project are summarized in Table 3 and are described in more detail in Appendices B-1 and B-2. The most difficult trucks to obtain were the three-axle single unit and those vehicles that had to be certified for sale in California.

The various types of gasoline trucks tested in this project are illustrated in Figure 4 and the types of diesel vehicles (except D3DIE) in Figure 5. All of the 3-axle truck-tractors had two drive axles. Most of the single unit 3-axle trucks, however, had only one drive axle. The designated coding used on the figures and throughout the project are given in Table 4.

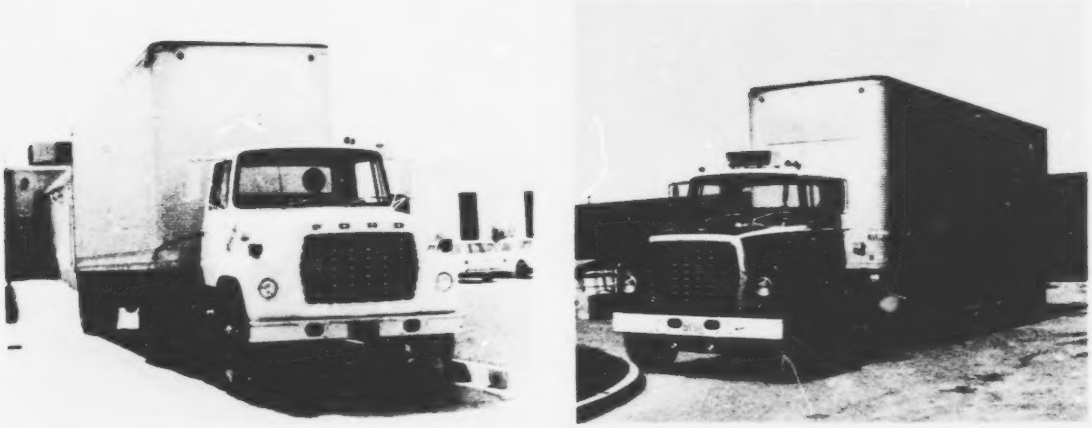
TABLE 3. DESCRIPTION OF VEHICLES

No.	Desc.*	Year	Make	Engine
1	D2GAS	1970	Dodge	Dodge - 318
2	D2GAS	1974	Chevrolet	Chevrolet - 366
3	D2GAS	1973	Ford	Ford - 361
4	D2GAS	1975	IHC	IHC - 345
5	D2GAS	1965	Chevrolet	Chevrolet - 292
6	D2GAS	1975	Ford	Ford - 391
7	D2GAS	1974	IHC	IHC - 392
8	D2GAS	1974	Dodge	Dodge - 361
9	D3GAS	1973	IHC	IHC - 345
10	TTGAS	1974	IHC	IHC - 478
11	D3GAS	1974	Chevrolet	Chevrolet - 366
12	TTGAS	1972	Ford	Ford - 477
13	TTGAS	1974	GMC	GMC - 427
14	TTGAS	1969	Ford	Ford - 391
15	D3GAS	1974	GMC	GMC - 427
16	D3GAS	1966	Chevrolet	Chevrolet - 366
17**	D2GAS	1975	IHC	IHC - 345
18**	TTGAS	1975	Ford Cal.	Ford - 389
19	D2DIE	1972	Ford	Cat. 1150
20**	TTDIE	1975	Ford	Cummins NTCC-350
21	TTDIE	1973	IH	Cummins NTC-290R
22	TTDIE	1971	Mack	Mack ENDT-675
23	TTDIE	1972	IH	Detroit Diesel 8V-71N
24	TTDIE	1975	Ford	Detroit Diesel 8V-71N
25	TTDIE	1975	IH	Cummins NTC-290R
26	TTDIE	1974	Ford	Detroit Diesel 6L-71N
27	TTDIE	1972	IH	Cummins V8-903
28	D3DIE	1967	Dodge	Cummins NH-220
29	D2DIE	1975	IH	Cat. 3208
30	D3DIE	1975	IH	Detroit Diesel 6V-53N
31		1972	GMC	Detroit Diesel 6V-71N
32		1975	MCI	Detroit Diesel 8V-71N

*Coding is described in Table 4.
**Meets California Emission Requirements.
Note: More detailed description is given in Appendix B-1.

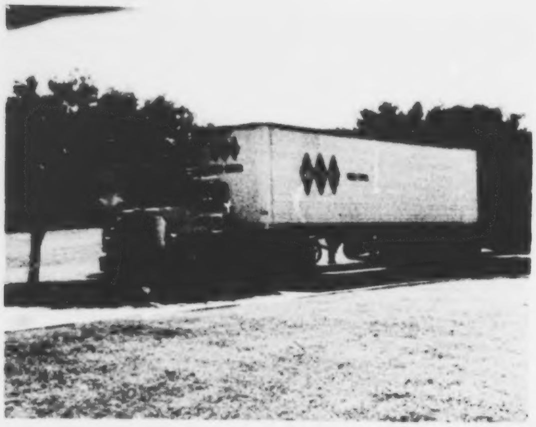
D2GAS

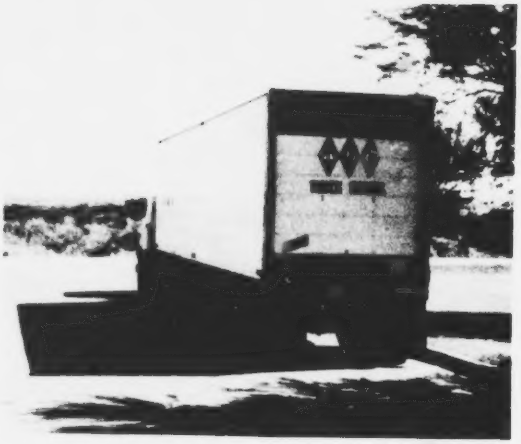
D3GAS



TTGAS

FIGURE 4. GASOLINE TRUCKS TESTED





TTDIE

D2DIE

BUS

FIGURE 5. DIESEL VEHICLES TESTED

TABLE 4. VEHICLE CODING SYSTEM

D2GAS - Single Unit, Two-Axle Gasoline Truck

D3GAS - Single Unit, Three-Axle Gasoline Truck

TTGAS - Gasoline Truck Tractor (All Two-Axle) Used with Single-Axle Trailer During Road Work

D2DIE - Single Unit, Two-Axle Diesel Truck

D3DIE - Single Unit, Three-Axle Diesel Truck

TTDIE - Diesel Truck-Tractor (All but one were 3-Axle) Used with Tandem-Axle Trailer During Road Work

BUS - Two-Axle Diesel Bus

E. Vehicle Preparation

The vehicles were run in what was essentially the as-received condition. Tune-up of gasoline engines was limited to the following:

> Tune-up limits were established by adding 3 degrees to the manufacturer's highest specified value for timing and dwell and by subtracting 3 degrees from the lowest. The idle rpm limits were established by appropriately adding or subtracting 100 rpm. If any parameter was outside of these tune-up limits, the parameter was adjusted to the nearest limit.

The primary criteria followed was if the vehicle operated in a reasonably acceptable manner, no repairs were made. If the vehicle did not operate in a reasonably acceptable manner, simple repairs were attempted (i.e., clean fuel filter, replace spark plug wire, file badly pitted points, adjust the brakes, tighten bolts on the accessory, etc.). The preceding simple repairs were only required on about three vehicles. Other relatively minor engine or vehicle malfunctions, even though obvious during the initial shake-down or during the laboratory evaluations, were not repaired.

F. Fuels and Lubricants

The composition of the gasoline and diesel fuels used in this project is given in Appendix A-1. The gasoline was leaded Exhaust and Evaporative Emissions Gasoline. A Type 2-D Diesel fuel was used in all diesel vehicles except the city bus. A Type 1-D Diesel fuel was used in the city bus. Lubricant, when required, was the brand and

grade specified by the owner of the vehicle.

G. Procedures and Cycles

A chassis version of the Nine-Mode gasoline heavy-duty test procedure was used with the eighteen gasoline trucks. Steady state, sinusoidal and driving cycle evaluations were conducted on all 32 vehicles included in this report. Chassis version thirteen-mode evaluations(16) were conducted on diesel vehicles 31 and 32 as part of the Task Order and on 19 through 30 under a separate project for the EMA. For all evaluations, except the nine-mode and thirteen-mode, chassis dynamometer road load settings at 40 mph coincided with those obtained for each vehicle on the road at empty, half and full load conditions.

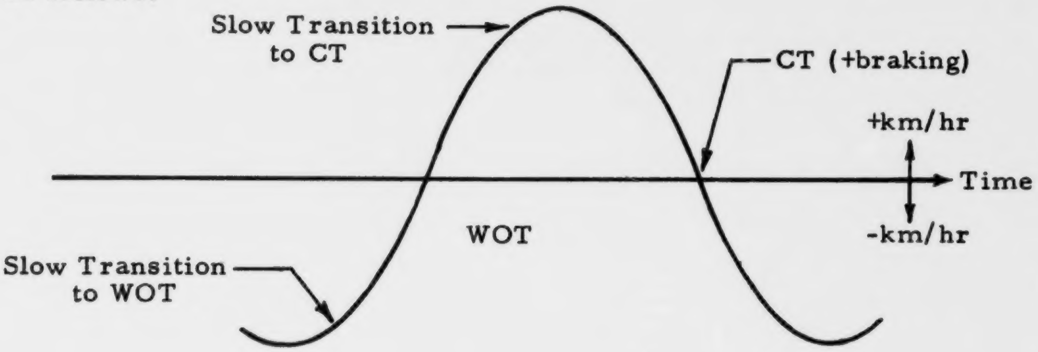
1. Steady State Operation

The steady state operation included idle and 8.05, 16.09, 24.14, 32.19, 48.28, 64.37 and 88.51 kilometer per hour. These steady states were respectively designated as 00, 05, 10, 15, 20, 30, 40 and 55 SS. Each steady state mode evaluation was of two minutes duration.

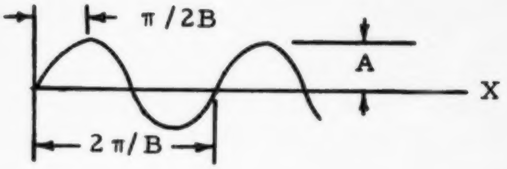
2. Sinusoidal Driving Pattern

A sinusoidal driving pattern was developed at full load conditions for each truck at each of three speeds (32.19, 48.28, and 64.37 km/hr). This pattern was then used for all three loads evaluated. In this project the various sinusoidal driving patterns used were designated 20, 30, and 40±5 and 20, 30 and 40±2. (The 5 represents an amplitude of 8.05 km/hr and the 2 an amplitude of 3.22 km/hr).

The time period for each individual cycle of the sinusoidal driving pattern was based on requiring full wide-open throttle and full cut-throttle operation when operating the plus or minus 8.05 km/hr sinusoidal under full load conditions. The driving characteristics required to follow a ±8.05 km/hr sinusoidal driving pattern at full load is briefly described as follows:



The sinusoidal driving patterns were developed as follows:



$Y = A \sin BX$

$Y^1 = AB \cos BX$ = slope

$Y^{11} = AB^2 \sin BX$ (=0 at X=0)

at $X=0$ slope = AB = max.

at $X = \pi/2B$ slope = 0

Let T = X = time

& $\Delta V = A$ = amplitude

& $M = AB = \Delta VB$ = max. slope

$\therefore V = V_o + \Delta V \sin (M/\Delta V)T$

$(M/\Delta V)T^* = \pi/2$ at $T^* = \pi/2B$

Let $M = 2\Delta V$/Time for WOT Accel from $V_o - \Delta V$ to $V_o + \Delta V$

$\therefore T_1^* = (\pi/4 \div\ ) \div$ (Time for WOT Accel)

at 0.33T*	$V=V_o+0.5\,\Delta V$
at 0.67T*	$V=V_o+0.866\,\Delta V$
at 1.00T*	$V=V_o+\Delta V$
at 1.33T*	$V=V_o+0.866\,\Delta V$

Etc. until 4.00T*

Using these relationships, a table was set up. The table values were then manually plotted onto the driver's aid chart.

3. Driving Cycle Operation

Driving cycles with nominal average speeds of 8.05, 16.09,

24.14, and 32.19 km/hr were run in this project. These cycles were respectively designated as 05, 10, 15, and 20 AVG. These driving cycles were provided by the EPA specifically for use in this project and were reported to be computer developed using available input data from CAPE 21.

The driving cycles are identified in Appendix B-3. This cycle data was manually plotted onto driver's aid chart paper. These master copies were then manually copied to provide charts for use in this project. A section of one each of the plotted cycles for D2GAS, TTGAS, TTDIE and BUS are given in Figure 6.

H. Vehicle Test Plan

Since the test plan changed as the project progressed, the plan given in this section will represent the way in which the project was actually conducted.

After acquisition and preparation of each vehicle, a parameter representing road-load horsepower was determined at a speed of 64.37 km/hr on the road at each of three loads. Empty load was the nearest dynamometer inertia weight to the empty weight of the truck, tractor-trailer combination, or bus with a driver, an observer and essential road test equipment. Half and full load conditions were obtained using concrete blocks and/or drums of water or bags of sand. Full load for test purposes was defined as the nearest available dynamometer inertia weight lower than the GVW. Half load was the nearest dynamometer inertia weight to the empty weight plus one half the difference between the GVW and the empty weight.

The vehicle was then installed onto the chassis dynamometer and the dynamometer horsepower settings were determined for the parameter value representing road-load horsepower. After this, acceleration times were obtained for use in setting up the sinusoidal driving patterns.

The chassis dynamometer evaluations conducted on the vehicles were as follows (The nine- or thirteen-mode tests were run at least twice on each vehicle and all other evaluations were run at empty, half, and full load):

Gasoline:	Trucks 01-18	Nine-Mode Procedure Eight Steady States Four Driving Cycles WOT at 2000 RPM
	Trucks 01-07	Six Sinusoidals (20, 30 & 40±5 and ±2)
	Trucks 08-18	Three Sinusoidals (20 & 30±5 and 40±2)

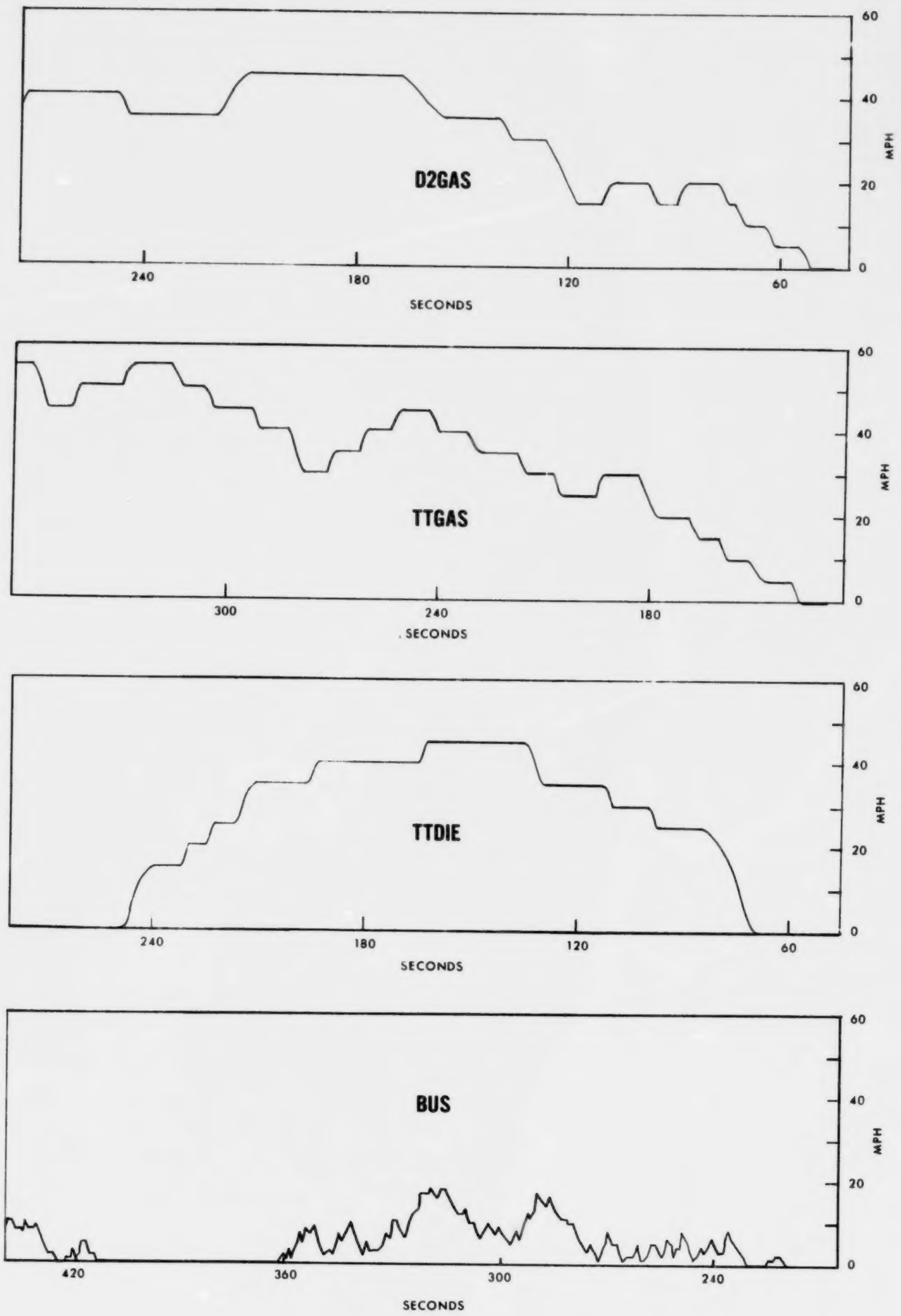


FIGURE 6. SECTIONS OF 15 AVG. DRIVING CYCLES

	Trucks 17 & 18	Repeat of the Steady States, Sinusoidals and Driving Cycles Four Alternate Driving Cycles
Diesel:	Trucks 19-30	Thirteen-Mode Procedure Eight Steady States Four Driving Cycles Three Sinusoidals (20 & 30± 5 and 40± 2)
	Trucks 24 & 25	Repeat of the Steady States, Sinusoidals and Driving Cycles Four Alternate Driving Cycles
	Buses 31 & 32	Thirteen-Mode Procedure Seven Steady States (omitted 55 SS) Two Sinusoidals (20 & 30± 5) Four Driving Cycles

Continuous data was recorded using the Metrodata recording system for all sinusoidal and driving cycle evaluations. The data tapes for gasoline Trucks 1 through 18 could not be evaluated until all laboratory evaluations were complete. The tapes for Trucks 19 through 30 and Buses 31 and 32 were processed prior to release of each vehicle.

I. Calculation Procedures

The emission rates for the gasoline vehicles were calculated using an SwRI computer program developed for this purpose and previously approved by EPA(12). Modifications primarily involved the output format and units. The program for processing the continuous (second by second) data utilized the same basic calculations.

Emission rate calculations for the diesel trucks were based on the prescribed calculations procedure for the thirteen-mode evaluation(13). The major exception involved the method for determining total exhaust flow for the transient evaluations where fuel flow measurements were not available. The method used was as follows:

$$HCMW = 12.011 + (HCR*1.008)$$
$$TC = CO_2 + CO + HC$$
$$EF = AF*2897/(2897-(TC*HCMW))$$

HCMW = Average molecular weight of the fuel hydrocarbons
TC = Total carbon in the exhaust in percent
AF = Measured air flow into engine
EF = Calculated exhaust flow

J. Discussion of Truck Driving

At the start of the project, a number of truck drivers were approached to determine how trucks are normally driven. The initial conclusion reached was that one probably cannot arrive at how trucks are driven by asking truck drivers. Next, several truck operating manuals were reviewed; and the general instructions given were such that these manuals are probably of little use in determining how trucks are driven (or even how they should be driven). The third approach was to ride in a truck driven by essentially all of the technicians in this laboratory who have a commercial license and have truck driving experience. This approach was very informative and even helped to explain the verbal information initially obtained from truck drivers.

Normal driving of a truck appears to include lugging, revving, and anything in between or both. The then EPA project manager was approached to see if EPA had a definition for normal driving of a truck based on CAPE 21 or any other studies. The answer received was that to his and the knowledge of those he contacted, EPA did not have such a definition.

Subsequently, after driving the cycles provided for this project, it was determined that gear shifting and engine rpm were basically controlled by the cycles. For example, the cycles for diesel tractor-trailer combinations fairly frequently have some 8 km/hr steady state operation after start-up from a stopped position. This essentially requires that the truck be started at or very near the lowest gear available, regardless of the load. Since sequential gear shifting is required in a large percentage of the diesel truck-tractors, at least through the first four or five gears, this essentially establishes the shifting pattern and engine rpms for low vehicle speed operation. The acceleration rates, at higher vehicle speeds required by the cycles, generally required the maximum acceleration rate attainable. This, in essence, tended to establish the shifting and engine rpms at higher vehicle speeds.

In summary, no norm could be found as to how trucks are driven for help in driving the transient cycles. In most cases, however, this lack of a norm has minimal effect on this project since the driving cycles tended to establish the driving characteristics relative to shifting and engine rpm. Since the driving characteristics used in this project are being compared to the overall CAPE 21 driving characteristics (in a separate analysis project), it will be informative to see how well the two compare.

K. Data Tapes

Both the continuous and the composite data are being provided to EPA on 9-track tape as a specific item of this project. The format and coding system used in making these tapes are given in Appendix A-2.

III. GASOLINE TRUCK RESULTS

This section presents the results of the evaluations conducted with the 18 gasoline trucks (Trucks 1 through 18). These included: road load determinations for setting dynamometer power; chassis version nine-mode evaluations; and steady state, sinusoidal and driving cycle evaluations.

A. Determination of Road Load

With the initial gasoline truck, several methods were investigated for obtaining the 64.37 km/hr (40 mph) road load conditions to be used in the chassis dynamometer. This vehicle speed of 64.37 km/hr was selected on the basis of it being within the speed range at which all the vehicles can operate while maintaining reasonable differences in power requirement for the various load conditions (i.e., empty, half and full load).

Multiple determinations of engine manifold vacuum and of vehicle acceleration and deceleration times were determined on the road and on the chassis dynamometer for the first truck. From these evaluations, it was determined that of the two methods, the use of manifold vacuum was more straightforward and repeatable. The use of manifold vacuum is also consistent with the Federal Register in that manifold vacuum is an accepted alternate method for establishing road-load horsepower in light duty vehicles. The manifold vacuum results were as follows on a still and a windy day in the 1970 Dodge truck with a 318 engine loaded to 7484 kg GVW. In these evaluations, the barometric pressure varied less than 2.5 mm Hg and the temperature varied less than 3°C.

		Manifold Vacuum, mm Hg		
Date	Direction	Measured	Average	Wind
11-29-74	S	305	261	North
	N	216		
12-2-74	S	267	267	Still
	N	267		

In obtaining the preceding manifold vacuums, measurements were taken both ways over a level road course. Additional determinations were made holding fixed manifold vacuums over a relatively long distance and then averaging the vehicle speed at each manifold vacuum. This alternative procedure gave results that were generally consistent within 5 to 10 mm of manifold vacuum.

Repeatability and reproducibility of acceleration and deceleration

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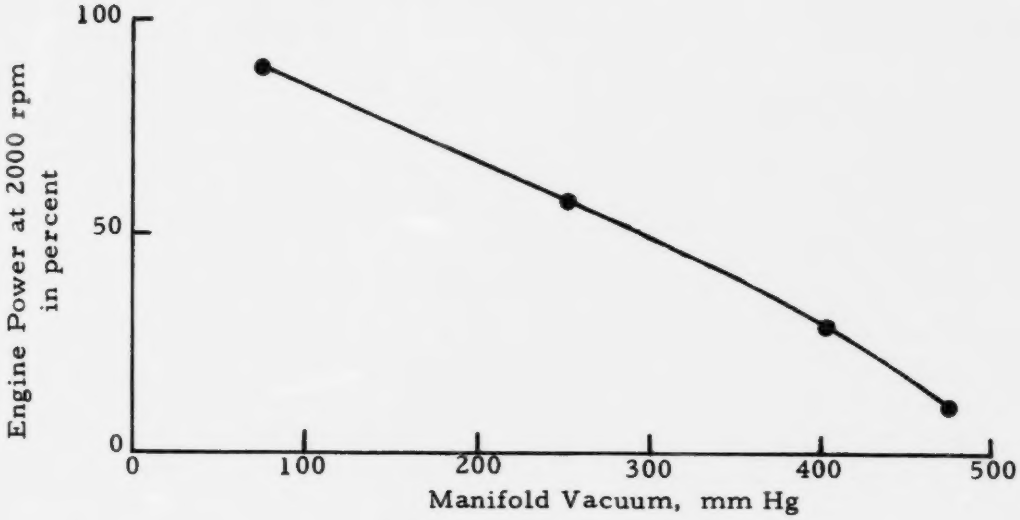
times were not as good. None of the readily available roads are exactly level for the long distances required by such a procedure and this factor was believed responsible for the variation associated with accels and decels. In addition to the variability of the accel or decel times, this method requires a time consuming trial and error procedure for establishing the road load horsepower on the chassis dynamometer from the data obtained on the road.

It is important to note the relationship of manifold vacuum to engine power output. The following figure illustrates the relationship between manifold vacuum and percent of maximum engine torque that was used in a previous EPA project entitled "Emission Control Technology Assessment of Heavy Duty Vehicle Engines".(10) With the first truck evaluated, the manifold vacuum was about 250 mm of mercury at 7500 kg GVW and 64.37 km per hour. As can be determined from the figure, for this operating condition, the relative variation in engine brake power is less than two tenths of a percent per each millimeter variation of manifold vacuum. At higher manifold vacuums (i.e., empty truck), however, the effect of variation in manifold vacuum would be more significant. For example, at 400 mm of manifold vacuum, the relative engine power varies more than three-tenths of a percent per each millimeter of manifold vacuum. A value of 400 mm of manifold vacuum is reasonably typical of road load at 81 km/hr in light duty vehicles. As an alternative to the road-load versus test-weight table, the Federal Register accepts this procedure for light duty vehicles. It was considered doubtful that the 64.37 km/hr road load manifold vacuums of any of the trucks would exceed 400 mm. Since the sensitivity of road load to manifold vacuum is less for large trucks than cars, this procedure was considered suitable for use in this project.



Therefore, the use of manifold vacuum was determined to be the best approach for establishing road load power on the chassis dynamometer especially in light of the rapid schedule of testing required by this project. It should be pointed out, however, that neither this procedure or any other currently available procedure enables determining an actual, accurate numerical value for the vehicle road-load horsepower in heavy duty trucks. For automobiles, the many problems associated with attempting to actually measure the vehicle road-load horsepower have been fairly well documented. In trucks, an additional problem is the significant friction losses in the drive axle and tires of the vehicle as a function of vehicle payload weight.

In this project, the manifold vacuums were determined at 64.37 km/hr on the road at full, half, and empty load. Then a determination was made of the power setting required on the dynamometer to obtain these vacuums at 64.37 km/hr. The same vacuum gauge and fifth wheel as used on road were used on the dynamometer. For this determination, the truck was empty and all inertia wheels were disconnected from the system. (Inertia has no direct effect on steady state horsepower). This enabled a determination of road load horsepower which had the following limitations:

(1) It did not take into account the variation in friction in the vehicle rear end and tires and in the dynamometer rolls due to changes in the axle load with changes in vehicle payload. The tires on the rolls and the physical strength of the dynamometer rolls and bearings are not capable of sustained operation of a fully loaded heavy duty truck.

(2) This does not take into account the variation in road load horsepower with variation in ambient temperature. (Note--in San Antonio, variation of barometric pressure and humidity conditions have a minimal effect.) No directly-usable temperature correction factors have been found to be available, and the time limitation in and the scope of this project prohibited the adaptation and verification of existing draft correction factors (i.e., as in the SAE draft procedure for determination of fuel consumption in automobiles) or development of factors specifically for heavy duty trucks.

A summary of the dynamometer power settings, for operating conditions equivalent to those at 64.37 km/hr on the highway is enclosed as Tables 5 and 6. As expected, trucks having the same load and frontal area (with one exception, Truck 17) require essentially the same dynamometer power setting. As shown in Table 6, at 64.37 km/hr, approximately 0.75 kW (1 hp) is required for each additional 454 kg (1000 lbs) of load. The associated change in manifold vacuum was nominally 3.3 mm of mercury.

TABLE 5. GASOLINE TRUCK ROAD-LOAD POWER SETTINGS ON THE CHASSIS DYNAMOMETER

At an operating speed of 64.37 km/hr with no inertia wheels connected

			Empty		Half		Full	
Truck	Make	Desc.	Load, kg	kW	Load, kg	kW	Load, kg	kW
D2								
1	Dodge	Van	3,402	13.4	5,262	16.4	7,348	21.6
2	Chevrolet	Van	5,534	14.5	7,257	16.4	9,072	20.9
3	Ford	Van	5,398	17.2	7,257	20.9	9,072	24.6
4	IHC	Van	5,262	17.9	7,257	19.4	9,072	25.0
5	Chevrolet	Van	5,216	15.5	7,257	17.2	9,072	22.4
6	Ford	Van	5,216	19.0	7,257	21.6	9,072	25.0
7	IHC	Van	5,262	14.9	7,257	19.4	9,072	21.6
8	Dodge	Van	5,216	14.5	7,257	18.0	9,072	20.9
17	IHC Cal.	Van	3,946	21.6	5,897	25.4	7,711	27.6
D3								
9	IHC	Van	7,257	21.5	12,474	28.5	18,370	35.9
11	Chevrolet	Flatbed	5,216	5.2	12,474	20.1	17,463	29.8
15	GMC	Dump Tr.	8,224	8.2	12,474	17.9	18,370	27.2
16	Chevrolet	Dump Tr.	7,257	12.9	12,474	19.2	18,370	31.3
TT								
10	IHC	Tractor	7,257	25.4	12,474	35.8	18,370	41.8
12	Ford	Tractor	7,257	26.8	12,474	35.0	18,370	44.7
13	GMC	Tractor	7,257	23.9	12,474	32.8	18,370	41.0
14	Ford	Tractor	7,257	25.4	12,474	33.6	18,370	41.8
18	Ford Cal.	Tractor	7,257	26.1	12,474	33.6	18,370	41.8

TABLE 6. SUMMARY OF CHASSIS DYNAMOMETER POWER SETTINGS

Truck Desc.	Qty.	Dyno. Power Settings at Various Loads (Kg)*, in kW 5,216	7,258	9,072	12,474	18,371
D2 Van	7	16.4	19.4	23.1	-	-
D3 Van	1	-	21.6	-	28.3	35.8
TT	5	-	25.4	-	34.3	42.5
Other D3	3	-	-	-	19.4	28.3
Other D2	2	-	-	-	-	-

Truck Desc.	Dyno. Power Change per 454 Kg Change in Gross Load, in kW
D2 Van	0.79
D3 All	0.66
TT	0.70
D2 Other	0.84
Weighted Average	0.75

Truck Desc.	Approx. Man. Vac. Change per 454 Kg Change in Gross Load
All	4 mm Hg.

*Maximum Variation from average power values shown was ±3 for Vans and ±2 for TTs.

D2 - Single Drive Axle (2 axles total) - Single Unit Truck
D3 - Tandem Axle (3 axles total) - Single Unit Truck
TT - Single Drive Axle (3 axles total) - Tractor-Trailer

A limited effort was made to relate these values to the probable variation associated with obtaining the values on the road. Based on experience in this project, the repeatability of the manifold vacuum determination is estimated to be around ±5 to 7 mm of mercury. Based on very limited data on one truck and a cursory analysis using formulas in the SAE Draft Procedure for Fuel Economy, change in manifold vacuum due to change in air temperature is estimated to be about 4 to 5 mm of mercury per 6°C. It is probably reasonable to conclude that overall reproducibility of the road load manifold vacuum determinations in this project would be on the order of 12 mm of mercury. A 12 mm change in manifold vacuum would be equivalent to a nominal 2 to 3 kW change in dynamometer power setting.

B. Discussion of Road Load Simulation*

An important aspect associated with a project of this type involves the simulation of road load on the chassis dynamometer. The problems relative to road load with heavy duty trucks involves obtaining a road load setting for the truck and then simulating the road load over a wide speed variation on the chassis dynamometer. These same problems exist with automobiles, but have a much less significant effect, since the Clayton water brake type chassis dynamometer by either design or chance appears to more closely simulate automobile road load horsepower throughout a range of vehicle speeds.

First, a brief review of the factors affecting road power. Typical expressions for the components of road load horsepower are:[17]

Rolling Resistance = A Coefficient x Weight x Velocity

Air Resistance = A Coefficient x Frontal Area x $(\text{Velocity})^3$

Road Grade = Weight x Grade x Velocity

Road load horsepower is then equal to the sum of the three components. For dynamometer simulation of operation on a level road, the road grade is not a factor and only rolling and air resistance need be simulated. Using the same reference, the equations for use with typical vehicles can be reduced to:

$$\text{R. R. HP} = \text{Weight} \times \text{MPH}/25,000$$

$$\text{A. R. HP} = (\text{Frontal Area in ft}^2) \times (\text{MPH})^3/300,000$$

*Section B is not a specific contract requirement, but is felt to be of sufficient importance to be included in this report for illustrative purposes. Therefore, this section retains in English units the formulas and other information originally given in English units.

Assuming the effective frontal areas are 21 ft^2 for standard size cars and 93 ft^2 for trucks 20,000 GVW and over, the following results are obtained.

	Road Horsepower								
	5,000 lb Car			25,000 GVW Truck			75,000 GVW Truck		
MPH	RR	AR	Total	RR	AR	Total	RR	AR	Total
10	2	<1	2	10	<1	10	30	<1	30
20	4	1	5	20	3	23	60	3	63
30	6	2	8	30	8	38	90	8	98
40	8	5	13	40	20	60	120	20	140
50	10	9	19	50	39	89	150	39	189
55	11	12	23	55	52	107	165	52	217

Now we will examine the preceding values in relation to the Clayton chassis dynamometer. In one of the automotive chassis dynamometer units at this laboratory the friction horsepower in the dynamometer system for a 5,000 pound vehicle is about 6 hp. This requires a load setting in the water brake dynamometer of 7.4 per the Federal Register (13.4-6). Since the water brake horsepower varies approximately as the cube of the MPH, the water brake essentially simulates the air resistance portion of the road horsepower. In addition, there is a small amount of windage resistance in the system, and for the sake of example we will assume windage to be 0.6 hp and the total simulation of air resistance equals to 8 hp (7.4 + 0.6). This agrees reasonably well with the 9 hp as previously determined using the formula.

Simulation of an empty truck (~10,000 pounds) driven at a road speed of 40 mph required a nominal load setting in the chassis dynamometer of about 20 horsepower; based on cursory examination of the values obtained in this project. With 25,000 pounds load, the setting was about 35 to 40 horsepower and with 40,000 pounds was about 50 to 55. The actual air resistance based on the preceding formula is supposed to be about 20 horsepower. Therefore, it appears that the air resistance portion of the road load is fairly well simulated for empty and lightly loaded trucks and is too high for heavily loaded trucks. It should be noted that in an enclosed van the loading of the truck has essentially no effect on the air resistance component of road load.

In order to more exactly simulate the road load with heavier trucks, it would become necessary to determine the value of the rolling and air resistant components. The air resistance component could then be simulated by the water brake and the rolling resistance component could be simulated by frictional drag of possibly a constant

torque dynamometer. Reasonable methods to make the determinations on the road and to obtain simulation of the rolling resistance portion of the road horsepower, are not currently available. This is an area where some research effort and possibly some demonstrative design and development effort appears to be worthwhile.

In transient operation the primary factor is the inertia, with road load setting having a much less significant effect. The road load horsepower setting in the chassis dynamometer has essentially no effect on heavy accelerations and decelerations near zero speed. However, the importance increases at a rate varying from almost a linear function of the vehicle speed at low speeds to almost a cubic function near maximum speed. Or to state it another way, the horsepower available for acceleration is equal to the gross rear wheel horsepower minus the steady speed road load horsepower. Therefore, any inaccuracies in road load horsepower when it is low (i.e., low speeds) have a negligible effect. Inaccuracies when road load horsepower is high (i.e., high speeds) can have a significant effect, however.

In summary of this and the previous section:

1. Consistent determination of road-load horsepower at a single speed on the road is difficult and time consuming. The determinations are significantly affected by the air temperature, wind speed and direction, levelness of the road, tire temperature, etc.

2. Reasonable methods are not presently available to enable breakdown of the total road-load horsepower into the rolling and air resistant components from field operations.

3. The present Clayton water brake chassis dynamometer units do not accurately simulate the road load horsepower over a wide speed range for very heavily loaded trucks from a single preset load-speed condition, such as 40 mph, as used in this project.

4. In heavy acceleration and cut-throttle operation, such as in the driving cycles used in this project, inertia has the primary effect. Therefore, the results of this project provide reasonably good simulation of similar cyclic road operation.

5. If the road-load could be broken down into the rolling resistance and air resistance components and if these components were then individually simulated on a chassis dynamometer, the simulation of road operation

could be significantly improved. Some research effort and possibly some demonstrative design and development effort involving road load simulation appears to be worthwhile.

As a result of this discussion of road-load simulation in the chassis dynamometer laboratory evaluations, it is quite likely for those road-loads for heavily loaded trucks (at or near gross or combined vehicle weight), that at speeds above 40 mph, the road load will be overstated. At speeds below 40 mph, the road load will be understated. The amount of over or under simulation will, of course, depend on the vehicle road-load power-speed relationship and the extent of road speed above or below 40 mph.

C. Results of Chassis Dynamometer Evaluations

The chassis dynamometer evaluations on the 18 gasoline trucks included: nine-mode, steady state, sinusoidal, and driving cycle operation. The results of the steady state and cyclic evaluations at empty, half, and full loads, the nine-mode evaluations and the 2000 rpm WOT operation are summarized for each gasoline truck in Appendix C.

1. Chassis Version Nine-Mode Emissions

The nine-mode emissions evaluations were conducted on the chassis dynamometer. Emission rates in grams per minute were calculated using the CVS diluted exhaust. The fuel flow rate was calculated from a carbon balance of the exhaust gases. In addition to the nine-mode evaluations, duplicate determinations were made of wide-open throttle (WOT) operation at 2000 rpm.

The bagged composite nine-mode and the composite modal results for the eighteen gasoline powered trucks are summarized in Appendix C-20. Individual modal results (from the continuous data recorded on chart paper) for one nine-mode for each gasoline truck evaluated are given in Appendix C-21.

The overall average bagged composite results and the overall average of the composite of the modal results were as follows for the chassis version nine-mode evaluations on the 18 gasoline trucks.

Emission	Bag Results in Relative %	Modal Results in Relative %
HC	100	100
CO	99	100
CO_2	97	100
NO_x	90	100
Fuel	97	100

These data indicate that the bag composite and the continuous modal composite produce essentially the same results. The only possible exception is the NO_x, if 10 percent overall average difference in NO_x can be considered as being significant. The modal data for Truck 03, the first truck to have nearly a 10 percent difference, was evaluated to determine the probable reason for the difference. In this truck, the average NO_x values for the 254 mm (10") Hg modes were 3 percent lower than the values for the last three seconds; and the average for the 76 mm (3") Hg modes was 6 percent lower than the last three seconds. This accounts for about 4 to 5 out of the 10 percent total difference in the composite NO_x values. The other 5 to 6 percent is not readily accounted for and possibly represents a summation of individually insignificant losses, interferences, etc. Some of the data for the other trucks were cursorily reviewed, and the general tendency (with a few exceptions) is for the NO_x to increase during the 254 mm Hg and 76 mm Hg modes; and therefore, generally account for part of the difference between the composite values.

2. Steady State Operation

The steady state operation included idle and 8.05, 16.09, 24.14, 32.19, 48.28, 64.37 and 88.51 kilometers per hour. These steady states were respectively designated as 00, 05, 10, 15, 20, 30, 40 and 55 SS. In a few trucks at full load operation, the 88.51 km/hr speed (55 SS) could not be attained. In such cases, a designation proportional to the speed attained is given on the appendix tables.

It quickly became apparent that there was no consistent relationship between the empty, half and full load steady state tests at the slower vehicle speeds. Based on the information from this (as discussed in Sections III.A. and III.B.) and other projects, Figure 7 has been developed to explain the probable reason for this lack of consistent relationship. The values shown in the figure are nominal values for illustration purposes only.

The figure illustrates the following: If the chassis dynamometer has a 3 kW (4 hp) difference between full and half load at 60 km/hr, at 30 km/hr, the difference is only 0.75 kW (1 hp). The frictional power in the overall truck-dynamometer system, however, essentially varies directly with speed; and at 30 km/hr would be about one-half the power at 60 km/hr. As the speed is decreased further, the difference in dynamometer power becomes essentially negligible and the normal variability of the overall test procedure exceeds the actual difference due to a change in load. In the transient cycles, the inertia is the primary factor and the effects of higher inertia loads on emissions and fuel consumption in transient cycles generally appears to be significant.

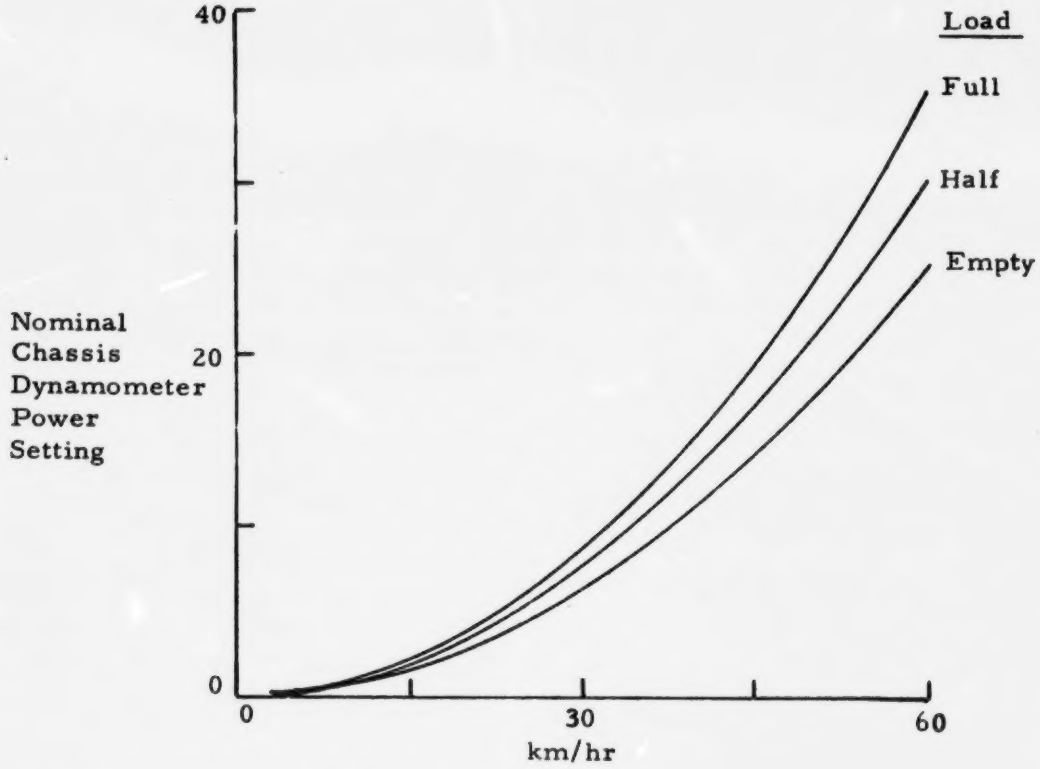


FIGURE 7. NOMINAL POWER RELATIONSHIPS FOR 9,000-KG GVW GASOLINE TRUCKS

3. Sinusoidal Driving Pattern

Sinusoidal driving patterns with average speeds of 32.19, 98.28 and 64.37 were run in this project. With the gasoline trucks, a reasonably appropriate gear-axle ratio could be selected for each of the sinusoidal patterns. The sinusoid period (reciprocal of the frequency) is given for each truck in Appendices C-1 through C-18 on the Tables XX-4.

4. Driving Cycle Operation

Driving cycles with nominal average speeds of 08, 16, 24, and 32 km/hr (5, 10, 15 and 20 mph) were run in this project. These driving cycles are identified in Appendix B-3. The designated distance and the actual distance traveled during operation of the driving cycles on the chassis dynamometer are given in Table 7.

In general, the distances traveled by the D2GAS trucks were not

TABLE 7. GASOLINE VEHICLE DRIVING CYCLE DISTANCE

Truck No.	Truck Desc.	Driving Cycle	Distance, kilometers Empty	Half	Full
01	D2	05	1.34	1.34	1.35
		10	2.62	2.59	2.62
		15	4.02	4.02	3.88
		20	5.79	5.76	5.84
02	D2	05	1.40	1.38	1.42
		10	2.62	2.64	2.69
		15	4.18	4.12	4.20
		20	5.78	5.70	5.75
03	D2	05	1.34	1.35	1.37
		10	2.64	2.64	2.64
		15	4.14	4.12	4.12
		20	5.84	5.75	5.75
04	D2	05	1.37	1.35	1.38
		10	2.62	2.66	2.64
		15	4.18	4.07	4.04
		20	5.8	5.83	5.91
05	D2	05	1.35	1.42	1.43
		10	2.66	2.70	2.67
		15	4.17	4.17	4.17
		20	5.94	5.92	5.86
06	D2	05	1.34	1.34	1.35
		10	2.64	2.66	2.66
		15	4.09	4.10	4.12
		20	5.92	5.97	5.94
07	D2	05	1.38	1.38	1.40
		10	2.69	2.67	2.6[illegible]
		15	4.10	4.10	4.09
		20	5.89	5.95	5.99
08	D2	05	1.35	1.35	1.35
		10	2.66	2.72	2.69
		15	4.15	4.10	4.15
		20	5.92	6.02	5.95
09	D3	05	1.59	1.58	1.53
		10	2.78	2.74	2.56
		15	4.23	4.07	3.80
		20	6.34	6.03	5.50

TABLE 7 (Cont'd). GASOLINE VEHICLE DRIVING CYCLE DISTANCE

Truck No.	Truck Desc.	Driving Cycle	Distance, kilometers Empty	Half	Full
10	TT	05	1.87	1.79	1.75
		10	3.09	3.03	2.88
		15	4.94	4.75	4.59
		20	6.92	6.44	6.28
11	D3	05	1.66	1.61	1.54
		10	2.77	2.69	2.64
		15	4.25	4.10	3.78
		20	6.44	6.20	5.83
12	TT	05	1.80	1.79	1.74
		10	3.01	2.99	2.74
		15	4.78	4.72	4.49
		20	6.73	6.44	5.99
13	TT	05	1.74	1.75	1.74
		10	3.03	2.99	2.95
		15	4.76	4.76	4.55
		20	6.68	6.69	6.31
14	TT	05	1.79	1.74	1.71
		10	3.06	2.98	2.74
		15	4.86	4.62	4.36
		20	6.84	6.42	5.89
15	D3	05	1.63	1.59	1.58
		10	2.77	2.75	2.64
		15	4.20	4.23	4.02
		20	6.52	6.47	6.20
16	D3	05	1.61	1.63	1.58
		10	2.72	2.75	2.64
		15	4.17	4.23	3.99
		20	6.37	6.47	6.10
17	D2	05	1.35	1.37	1.35
		10	2.66	2.67	2.66
		15	4.15	4.12	4.15
		20	5.94	5.99	5.92
17	D2	05	1.35	1.35	1.34
Repeat		10	2.67	2.64	2.62
		15	4.15	4.12	4.07
		20	5.95	5.89	5.86

TABLE 7 (Cont'd). GASOLINE VEHICLE DRIVING CYCLE DISTANCE

Truck No.	Truck Desc.	Driving Cycle	Distance, kilometers Empty	Half	Full
17	D2	05	1.38	1.38	1.37
Alt.		10	2.62	2.62	2.59
Cycles		15	4.14	4.12	4.07
		20	5.57	5.57	5.52
18	TT	05	1.79	1.79	1.72
		10	2.90	2.86	2.77
		15	4.80	4.73	4.52
		20	6.73	6.44	6.08
18	TT	05	1.79	1.79	1.74
Repeat		10	3.01	2.90	2.78
		15	4.83	4.73	4.51
		20	6.73	6.47	6.15
18	TT	05	1.53	1.53	1.53
Alt.		10	3.07	3.01	2.86
Cycles		15	4.99	4.86	4.57
		20	6.26	6.07	5.73

DESIGNED DISTANCES

Truck No.	Truck Desc.	Driv. Cycle	km	Truck No.	Truck Desc.	Driv. Cycle	km
	D2	05	1.36	17	D2	05	1.38
17 Repeat		10	2.66	Alt.	Alt.	10	2.60
		15	4.13			15	4.11
		20	5.94			20	5.56
09, 11,	D3	05	1.63				
15, 16		10	2.78				
		15	4.29				
		20	6.50				
10, 12,	TT	05	1.78	18	TT	05	1.52
13, 14		10	3.06	Alt.	Alt.	10	3.13
18,		15	4.85			15	5.17
18 Repeat		20	6.85			20	6.49

significantly affected by the load since these trucks could come relatively close to driving the cycle. In most cases, however, the computer generated stairsteps in the cycles were rounded-off by the truck at the higher loads. The cycle distances traveled by the D3GAS trucks were significantly affected by load since generally the cycle could only be essentially followed at empty load. The TTGAS tractor-trailers, generally having the same loading but higher horsepower to weight ratios than the D3GAS trucks, could follow the cycles somewhat better than the D3GAS trucks. Sections of the D2GAS and TTGAS driving cycle traces are given in Figure 8.

5. Repeat Runs and Additional Driving Cycles

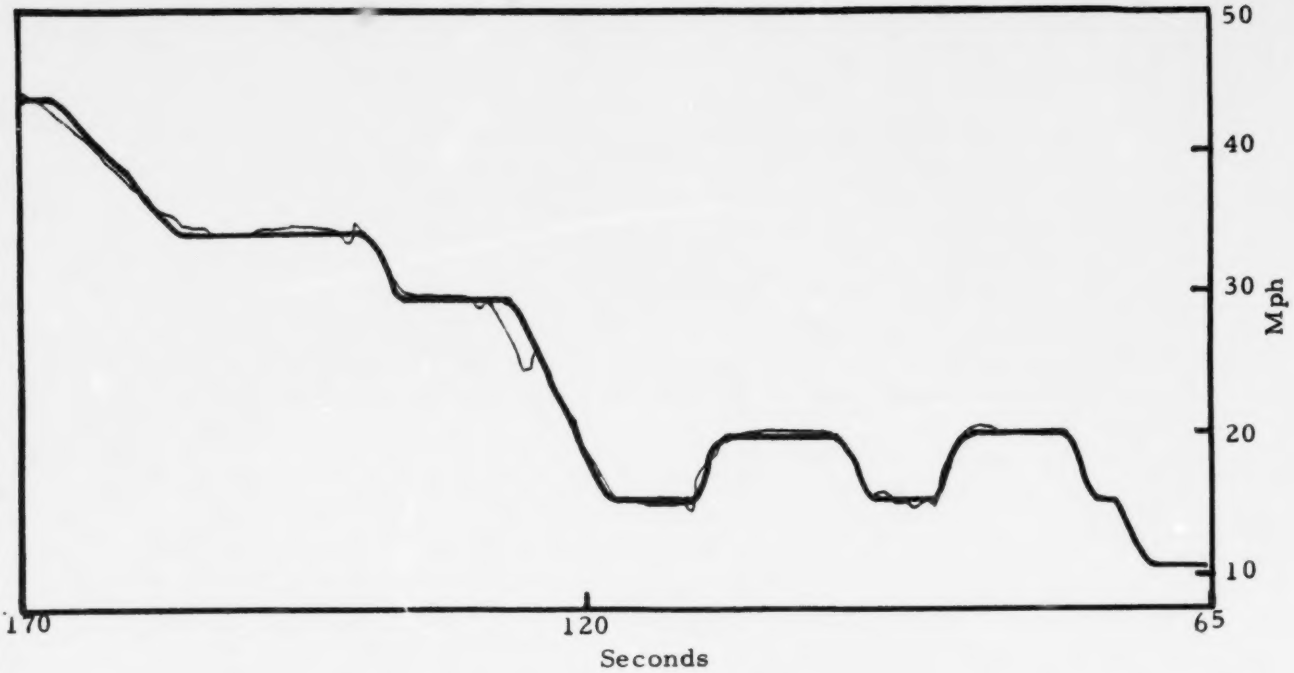
The repeat runs and the additional driving cycles were conducted on Trucks 17 and 18. Both of these trucks were 1975 models certified for California. During the road work these trucks appeared to be among the least repeatable of all the trucks tested. This appeared to be due to the EGR systems. It was therefore anticipated that the EGR systems on both trucks would also decrease repeatability of the chassis dynamometer evaluations. The data in Appendices C-17 and C-18 show that the repeatability during the emissions evaluations, however, was quite good.

6. Continuous Data Analysis

A Metrodata 20-channel recording system was used to continuously record the sinusoidal and driving cycle data. Initially no provisions were made in the contract for processing the data. Subsequently, a contract modification and a data processing contract were received. However, by this time the laboratory evaluations of the gasoline trucks were almost complete. As expected, under these circumstances, difficulties were encountered with some of the data on several of the trucks. Fortunately, however, nearly all of the problems were correctable or of no significance.

With some emissions, the values at or near idle relative to values at or near WOT are greatly different (i.e., with gasoline trucks, the value for NO_x at WOT has been a hundred or more times greater than the NO_x at idle). When recording the driving cycles, therefore, the range required to contain the spikes during acceleration often does not enable good readability at some of the other operating conditions. This is illustrated in the reasonably typical emissions trace shown in Figure 9.

With the gasoline trucks, the following table illustrates the relationship between composite emissions rate and average meter reading (meter reading scale is 0 to 100).



TRUCK 06 D2GAS 15 AVG. CYCLE
Half Payload

TRUCK 13 TTGAS 15 AVG. CYCLE
Half Payload

FIGURE 8. GASOLINE TRUCK DRIVING CYCLE TRACES

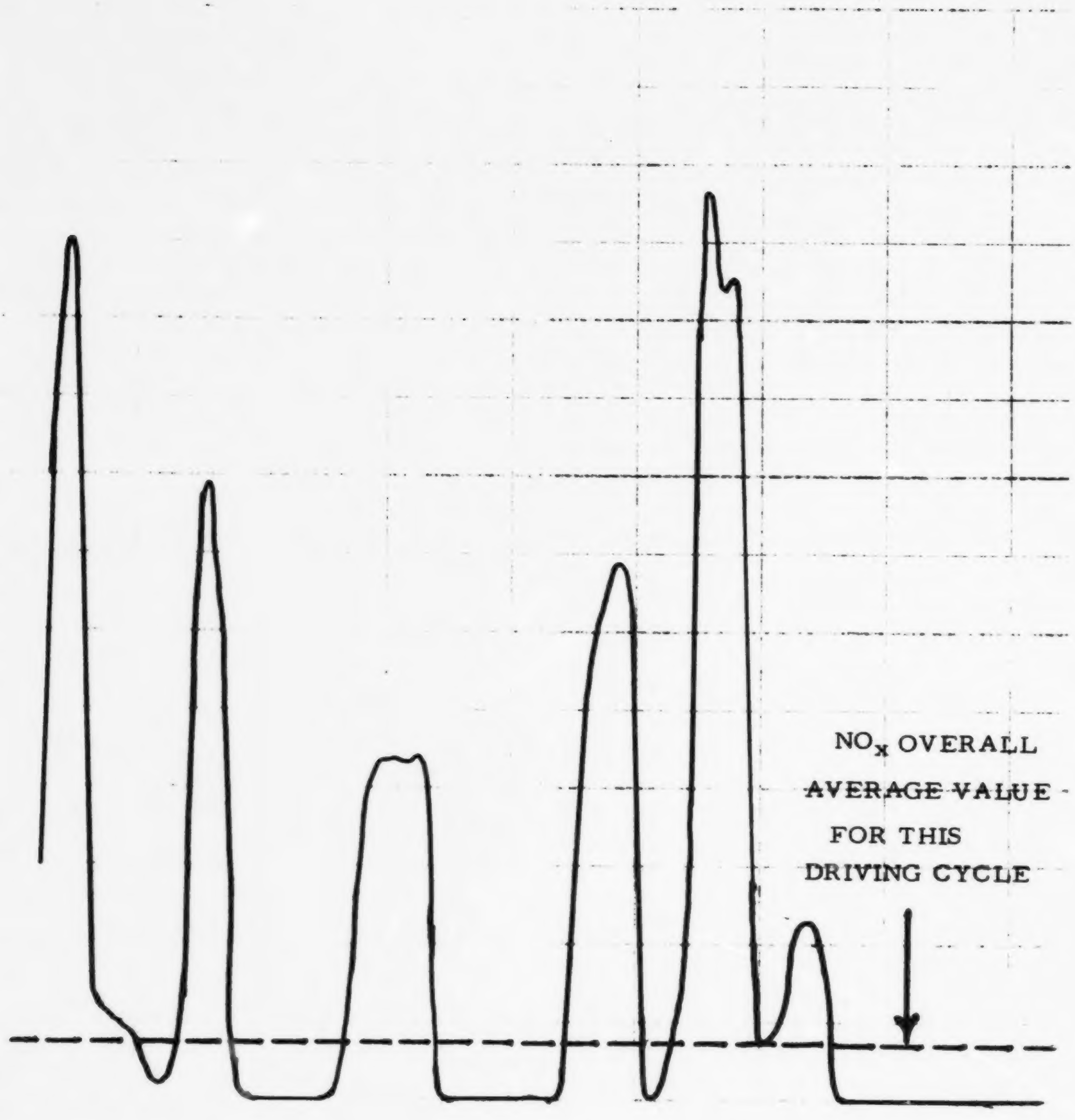


FIGURE 9. GASOLINE TRUCK DRIVING CYCLE
NO_X EMISSION TRACE

Emission	g/min	Average meter divisions
HC	1	1.5
CO	10	3.0
CO_2	100	14.0
NO_x	1	2.0

On some of the driving cycles, the NO_x has been as low as 1 g/min. A 1 percent of full scale zero shift, therefore, would result in a 50 percent change in the average value calculated from the continuous chart for such a test. (It should be emphasized that this does not apply to the bag readings, which are always read at values above 10 percent and generally above 20 percent of full scale.) For determination of emissions during specific accelerations, however, the potential for inaccuracy generally becomes negligible. For example, NO_x emissions during idle and cut-throttle operation, in a gasoline truck, are almost zero but are generally high (between 20 to 80 percent of full scale) during accelerations and high speed operations. A 1 percent of full scale NO_x zero shift would generally result in only a few percent inaccuracy for operation other than idle, cut-throttle or low speed steady-state.

In summary, with the gasoline trucks, the continuous data should provide accurate data for all conditions at which significant levels of the specific emission are produced. In general, this includes accelerations for all emissions and decelerations for all emissions except NO_x.

6. Other Discussion

From high HC emissions obtained with Truck 17 in the CT mode, of the 9-mode test, it was apparent that the deceleration rate control device was not functioning properly. With Truck 18, WOT acceleration was somewhat poor, possibly due to a malfunctioning of the power valve system in the carburetor. The deceleration rate control device was checked during initial tune-up and was not functioning. It was determined that the tubing to the vacuum operated plunger on the carburetor was kinked, thereby closing off the line.

After eliminating the kink in the tubing, the electronic speed sensor in the decel device system was found to be malfunctioning and would not allow the engine to return to idle rpm. These situations with Truck 18 were discussed with the EPA Project Leader and the decision was reached to run the truck in the as-received condition. The only other occurrence of some significance with Truck 18 was that the air pump mounting bolts loosened during the dynamometer evaluations and made the pump inoperative. It should be noted that both Trucks 17 and 18 were brand new.

IV. DIESEL TRUCK RESULTS

This section presents the results of the evaluations conducted with the 12 diesel trucks (Trucks 19 through 30). These included: road load determinations for setting dynamometer horsepower; and steady state, sinusoidal and driving cycle evaluations. With EPA concurrence, chassis version 13-mode evaluations were determined on these 12 trucks for the Engine Manufacturers Association (EMA). With EMA concurrence, the results of the 13-mode evaluations in terms of grams per minute are summarized in this report.

A. Determination of Road Load

Methods evaluated for the determination of road-load included: a ball-type flowmeter, total fuel used at constant speed over a fixed distance, and average CO_2 (using a bag) at constant speed over a fixed distance (and rail pressure with Cummins engines). Determination of rack position was considered but was not used in determining road load. The change in rack position from empty to full load was considered too small to enable reliable determinations (i.e., 2 percent rack change in Truck 19, 6 percent in Truck 21). All of the methods tried, except rail pressure, left something to be desired.

The flowmeter approach is desirable since it provides continuous (although somewhat erratic) data and takes considerably less time; therefore allowing for more determinations. However, the flowmeter approach appears to be applicable to only a very limited number of trucks. The bagged CO_2 method appeared to be the least reliable. With Cummins engines, there is much less problem in determining road load, since the rail pressure appears to be relatively stable and is quick and easy to determine. Extreme care is required, however, to assure that the system used in measuring the rail pressure does not affect the operation of the engine. It has been found that small volume, rigid, air-free lines and measuring devices are required. The determination of road-load using rail pressure appears to be about equivalent to the determination of road-load using manifold vacuum in gasoline trucks. The determination of road-load, using total fuel consumed over a fixed distance, was found to be reasonably reliable. This method, however, is among the more difficult and time-consuming. Unfortunately, the use of this method was considered necessary with most of the diesel vehicles tested.

A summary of the dynamometer power settings, for operating conditions equivalent to those at 64.37 km/hr on the highway, is enclosed as Table 8. The previously discussed evaluations with gasoline trucks concerning the significance of this dynamometer horsepower setting also applies to diesel trucks. In general, diesel trucks and truck-tractors having the same load, frontal area and number of drive axles require similar dynamometer power settings.

TABLE 8. DIESEL TRUCK ROAD POWER SETTINGS ON THE CHASSIS DYNAMOMETER

At an operating speed of 64.37 km/hr with no inertia wheels connected

Truck	Make	Desc.	Empty Load, kg	Empty kW	Half Load, kg	Half kW	Full Load, kg	Full kW
D2								
19	Ford	Van	5,216	15.7	7,257	21.6	9,072	26.1
29	IH	Van	7,257	23.1	11,113	26.8	18,370	29.8
D3								
28	Dodge	Dump tr.	7,257	15.3	11,113	22.4	18,370	35.8
30	IH	Refr. Van	7,257	21.6	11,113	27.6	18,370	38.0
TT								
20	Ford	Tractor	11,113	29.8	22,226	44.7	33,339	55.2
21	IH	Tractor	11,113	23.9	22,226	41.8	33,339	53.7
22	Mack	Tractor	11,113	38.8	22,226	67.1	33,339	85.0
23	IH	Tractor	11,113	29.8	22,226	49.2	33,339	61.1
24	Ford	Tractor	11,113	23.9	22,226	37.3	33,339	61.1
25	IH	Tractor	11,113	20.9	22,226	41.8	33,339	61.1
26	Ford	Tractor	7,257	27.6	14,515	37.3	21,772	47.7
27	IH	Tractor	11,113	28.3	22,226	46.2	33,339	68.6

B. Chassis Dynamometer Cycle Results

The chassis dynamometer evaluations on the 12 diesel trucks included: 13-mode (for EMA), steady state, sinusoidal and driving cycle operation. The results of the steady state and cyclic evaluations at empty, half, and full loads, and the 13-mode evaluations are summarized for each diesel truck in Appendix D.

1. Chassis Version 13-Mode Emissions

The 13-mode emissions determinations were conducted for the EMA and were presented in detail in a report to EMA[18]. These 13-mode evaluations were conducted on the chassis dynamometer in accordance with the method given in reference 16; with the exception of using the same emissions instrumentation as used for the steady state and cyclic evaluations. Only the results in terms of grams per minute are summarized in this report.

2. Steady State Operation

The steady state operation for the diesel trucks included idle and 8.05, 16.09, 24.14, 32.19, 48.28, 64.37 and 88.51 kilometers per hour. In cases where the 88.51 km/hr could not be attained, a designation proportional to the speed attained is given in the appendix tables. As with the gasoline trucks, the water brake dynamometer was used to set the road-load power during operation of the vehicle on the chassis dynamometer.

3. Sinusoidal Driving Pattern

The sinusoidal driving pattern was developed and driven at average speeds of 32.19, 48.28 and 64.37 km/hr. The sinusoid period (reciprocal of the frequency) is given for each truck in Appendices D-1 through D-12 on Tables XX-4.

With a few of the diesel trucks, it was difficult to select a gear-axle ratio which would enable staying above the recommended lower operating speed of the engine. The primary difficulty was in determining the acceleration rates for setting up the sinusoidal pattern, rather than in the driving of the resulting pattern. Determining the acceleration rate required starting a few km/hr below the lowest speed of the sinusoidal pattern. An alternate method developed was to narrow down the speed range over which the acceleration rate was determined.

4. Driving Cycle Operation

Driving cycles with nominal average speeds of 8, 16, 24 and 32 km/hr (5, 10, 15 and 20 mph) were run in this project. These driving cycles are identified in Appendix B-3. The designed distance and the

actual distance traveled during operation of the cycles on the chassis dynamometer are given in Table 9.

Essentially all of the diesel trucks could attain the maximum speed required by the cycles. A reasonably typical section of a driving cycle trace is shown in Figure 10. This trace illustrates that, except for gear shifting, inability to attain some of the acceleration rates and the rounding off of sharp corners, the diesel trucks could generally follow the driving cycles. Therefore, with few exceptions, load had no significant effect on distance traveled.

5. Repeat Runs and Additional Driving Cycles

The repeat runs and additional driving cycles were conducted on Trucks 24 and 25. The data in Appendices D-6 and D-7 show that the repeatability was generally good.

6. Continuous Data Analysis

For the diesel trucks, the Metrodata recording of the transient data was generally processed and reviewed before release of the truck. It is this data which is reported in the appendices.

With the diesel trucks, since a CVS was not used, the relationship between calculated grams per minute and reading on the emissions instrument is not as straightforward. The following, however, is suitably accurate for illustrative purposes:

Emission	g/min	Average meter divisions
HC	1	20
CO	1	5
CO_2	100	10
NO_x	1	5

With the diesel trucks, the NO_x values were generally 2 g/min and greater for the driving cycles. Therefore, the potential for error in the composite results due to zero shift is relatively small (i.e., always less than 10 percent per chart division). The potential for error for HC is about the same as for NO_x. With CO_2, the potential for error is very small (i.e., less than 3 percent per chart division). The potential for error for CO, however, is more significant on a percentage basis (20 percent) but is insignificant on an absolute basis (0.2 g/min). With the diesel trucks, continuous data should provide reasonably accurate data over all conditions for all emissions. Although the CO can vary significantly on a percentage basis, it should not vary greatly on an absolute basis in terms of grams per minute.

TABLE 9. DIESEL VEHICLE DRIVING CYCLE DISTANCE

Truck No.	Truck Desc.	Driving Cycle	Distance, kilometers Empty	Half	Full
19	D2	05	1.62	1.61	1.62
		10	2.96	2.83	2.89
		15	5.12	5.03	5.15
		20	6.97	6.91	6.94
20	TT	05	1.93	1.90	1.86
		10	3.33	3.50	3.48
		15	4.58	4.50	4.46
		20	5.63	5.75	5.67
21	TT	05	1.84	1.87	1.86
		10	3.58	3.43	3.18
		15	4.57	4.50	4.44
		20	5.73	5.70	5.60
22	TT	05	1.80	1.68	1.78
		10	3.54	3.09	3.34
		15	4.52	4.48	4.27
		20	5.60	5.62	5.30
23	TT	05	1.86	1.88	1.81
		10	3.51	3.47	3.39
		15	4.44	4.47	4.38
		20	5.77	5.66	5.58
24	TT	05	1.87	1.79	1.83
		10	3.49	3.44	3.47
		15	4.56	4.55	4.43
		20	5.73	5.72	5.61
24 Repeat	TT	05	1.83	1.88	1.84
		10	3.57	3.50	3.47
		15	4.65	4.63	4.56
		20	5.84	5.78	5.68
24 Alt.	TT	05	1.68	1.45	1.63
		10	3.46	3.39	3.24
		15	5.04	5.07	4.79
		20	5.69	5.67	5.66
25	TT	05	1.85	1.92	1.91
		10	3.56	3.61	3.55
		15	4.66	4.64	4.49
		20	5.92	5.79	5.76
25 Repeat	TT	05	1.82	1.88	1.83
		10	3.47	3.49	3.44
		15	4.58	4.51	4.47
		20	5.75	5.68	5.59

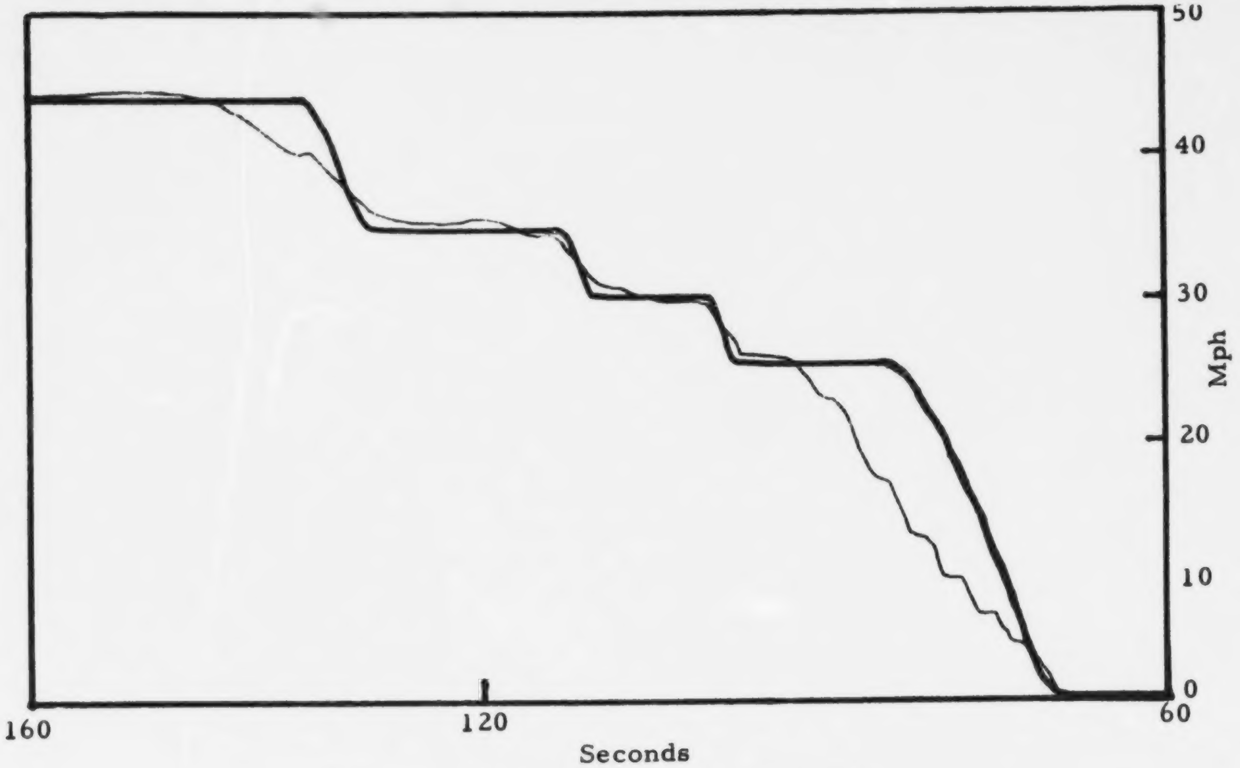
TABLE 9 (Cont'd). DIESEL VEHICLE DRIVING CYCLE DISTANCE

Truck		Driving	Distance, kilometers		
No.	Desc.	Cycle	Empty	Half	Full
25 Alt.	TT	05	2.07	2.05	1.92
		10	3.48	3.40	3.34
		15	4.88	4.79	4.57
		20	6.86	6.83	6.56
26	TT	05	1.87	1.87	1.83
		10	3.50	3.59	3.39
		15	4.50	4.65	4.54
		20	5.76	5.81	5.70
27	TT	05	1.96	1.97	1.97
		10	3.69	3.67	3.58
		15	4.50	4.74	4.69
		20	5.81	5.99	5.95
28	D3	05	1.86	1.79	1.80
		10	3.32	3.22	3.33
		15	4.30	4.11	4.16
		20	6.63	6.43	6.62
29	D2	05	1.60	1.59	1.64
		10	2.85	2.95	3.01
		15	5.13	5.06	5.11
		20	6.9[illegible]	6.97	6.79
30	D3	05	1.82	1.77	1.81
		10	3.35	3.27	3.31
		15	4.28	4.13	4.17
		20	6.61	6.43	6.45

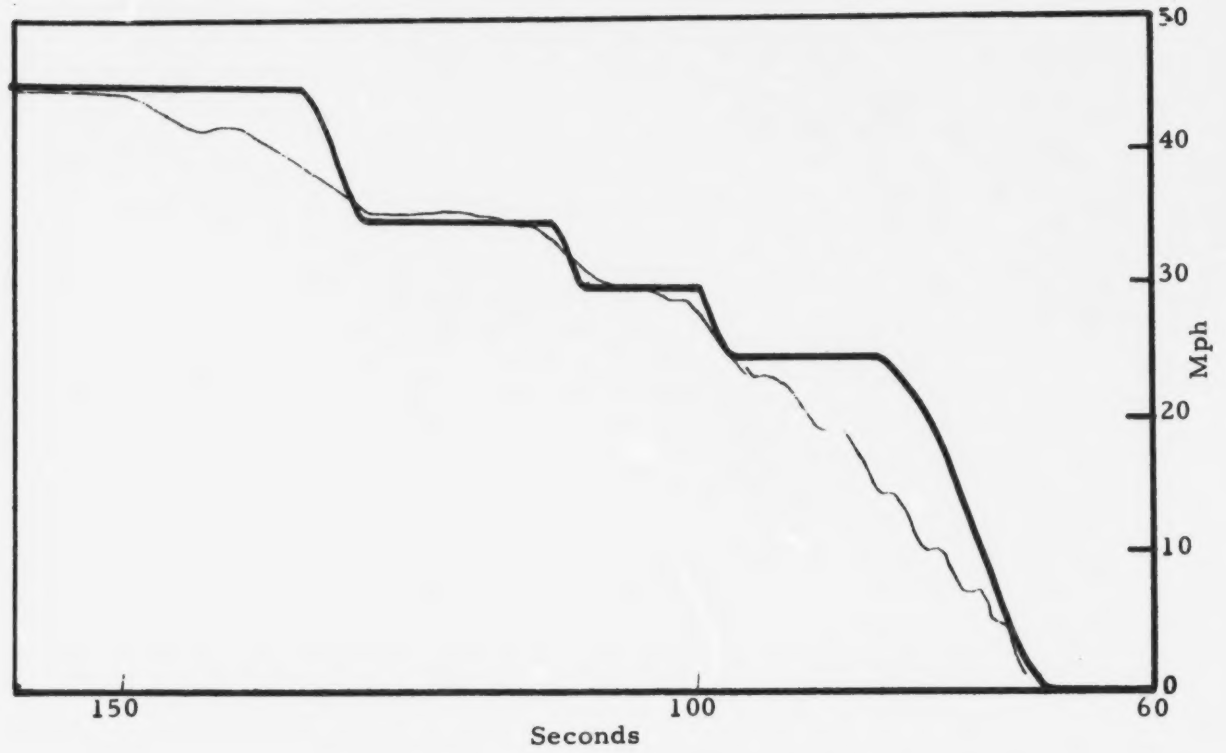
DESIGNED DISTANCES

Truck		Driv.	
No.	Desc.	Cycle	km
19, 29	D2	05	1.61
		10	2.92
		15	5.08
		20	7.11
20, 21, 22, 23, 24, 24 Repeat 25, 25 Repeat 26, 27	TT	05	1.89
		10	3.55
		15	4.64
		20	5.82

Truck		Driv.	
No.	Desc.	Cycle	km
28, 30	D3	05	1.77
		10	3.31
		15	4.28
		20	6.48
24 Alt.	TT A#1	05	1.75
		10	3.58
		15	5.14
		20	5.81
25 Alt.	TT A#2	05	1.98
		10	3.40
		15	4.78
		20	6.55



TRUCK 24 TTDIE 15 AVG. CYCLE
Half Payload



TRUCK 25 TTDIE 15 AVG. CYCLE
Half Payload

FIGURE 10. DIESEL TRUCK DRIVING CYCLE TRACES

V. DIESEL BUS RESULTS

Two diesel buses, one city (Bus 31) and one intercity (Bus 32), were evaluated in this project. These evaluations included: road-load determinations for setting dynamometer power; chassis version thirteen-mode evaluations; and steady state, sinusoidal and driving cycle evaluations. Results of these evaluations are given in Appendix E.

The nominal speeds, instrumentation and analysis used were the same as used for the diesel trucks except for omission of the 88.51 km/hr (55 SS) steady state and the 64.37 km/hr (40± 2) sinusoidal. The driving cycles provided for the buses were also significantly different in general appearance than those provided for the trucks. The designed distance and actual distance traveled during operation of the driving cycle on the chassis dynamometer are given in Table 10.

TABLE 10. DIESEL BUS DRIVING CYCLE DISTANCE

Bus No.	Driving Cycle	Distance, kilometers Empty	Half	Full
31	05	2.53	2.35	2.49
	10	4.75	4.72	4.63
	15	6.68	6.76	6.61
	20	8.06	7.81	7.90
32	05	2.51	2.44	2.49
	10	4.78	4.86	4.66
	15	6.50	7.07	7.00
	20	8.24	8.23	8.06
		Designed Distances		
	05		2.38	
	10		4.68	
	15		6.84	
	20		8.01	

A major difficulty was encountered with the tires on the city bus. To help remedy the situation, a complete set of high speed highway tires had to be purchased. Other difficulties involved road-load power and the capability of driving the cycles.

The differences in fuel flow (or rack setting) on the road for empty, half and full loads were almost negligible. For example, going from empty to full load changed the fuel flow less than ten percent. This amount is only about two to three times the repeatability of a determination for a single load condition. The road-load power settings on the chassis dynamometer are given in Table 11.

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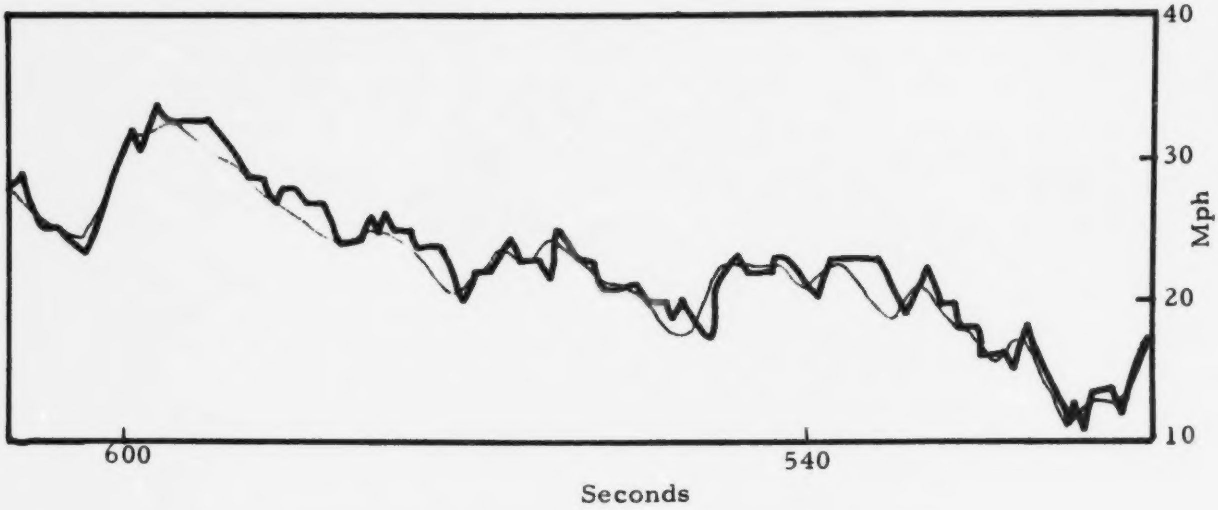
TABLE 11. DIESEL BUS ROAD-LOAD POWER SETTING ON THE CHASSIS DYNAMOMETER

			Empty		Half		Full	
Bus	Make	Desc.	Load, kg	kW	Load, kg	kW	Load, kg	kW
31	GMC	City Bus	9,752	22.4	11,113	26.1	13,601	31.3
32	MCI	Intercity	9,752	23.9	11,113	26.1	13,601	29.1

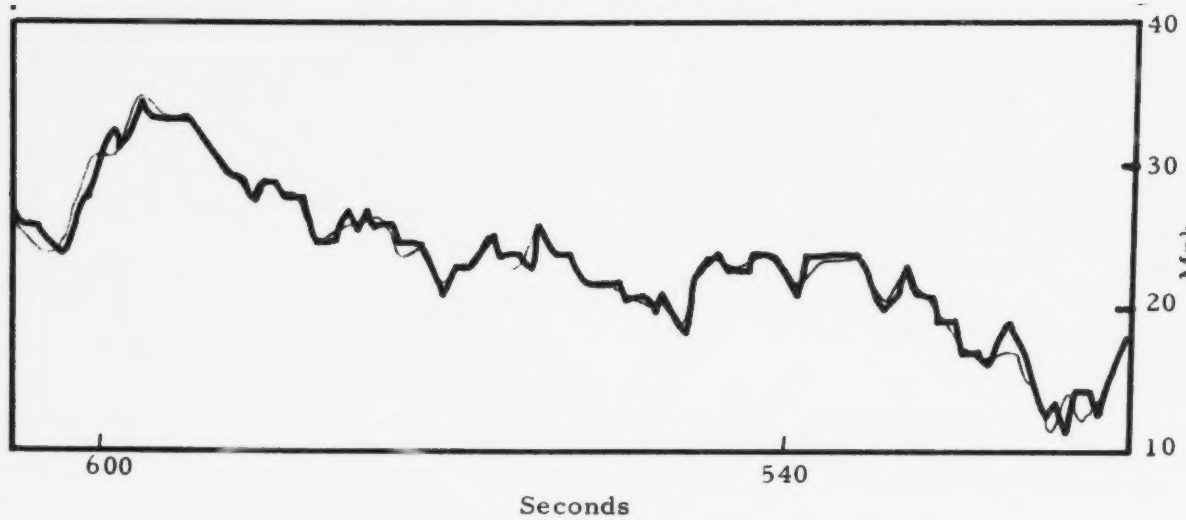
In order for the tires to survive on the dynamometer, it was necessary to reduce the force against the dynamometer rolls (i.e., support some of the weight of the bus by means other than the dynamometer rolls). This was accomplished by raising the rear end of the bus. Due to the air suspension system that is used on the buses, however, it is difficult to consistently maintain the same amount of force against the dynamometer rolls. Any difference in force against the dynamometer rolls affects the total absorbed power versus vehicle speed relationship (i.e., friction power essentially varies as a direct function of speed, whereas power set in the dynamometer varies as a cubic function of the speed). Considerable effort was made to minimize this factor.

The cycles had repeated sharp spikes which could not be attained with either bus; primarily with Bus 31 (the city bus). Bus 31 had a two-speed automatic transmission with free-wheeling during decelerations in the low-speed range, and a lower power to weight ratio than Bus 32. These driving cycles were used on the basis of having one second per record as was the case with all the truck driving cycles. A portion of a driving cycle is shown in Figure 11.

As the inertia load was increased, Bus 31 was less able to follow the spikes of the driving cycles. In addition, as the driver became less able to meet the spiked accelerations and decelerations, he apparently tended to drive in a much smoother pattern. This factor appeared to be the primary reason for the apparent inconsistency in the driving cycle data for Bus 31. In addition, the friction horsepower to water-brake dynamometer horsepower ratio may have had a minor effect. With Bus 32, considerable effort was expended in arriving at a more reasonable approach toward driving the cycles. First, a determination was made to see how well the spikes could be followed. Second, based on these results, an engineering decision was reached as to what would be the best approach toward driving the cycles. Then, the driver was trained to drive in that manner. Basically, those spikes which could not possibly be attained were mentally smoothed over. The primary effect of this approach was to eliminate the rapid throttle oscillations.



BUS 31 DIESEL CITY BUS 15 AVG. CYCLE
Half Payload



BUS 32 DIESEL INTERCITY BUS 15 AVG. CYCLE
Half Payload

FIGURE 11. DIESEL BUS DRIVING CYCLE TRACES

This had minimal effect on the resulting driving traces and actually resulted in somewhat better overall following of the cycles.

VI. SUMMARY

The project and some of the primary findings are summarized as follows:

Scope - This project involved the determination of exhaust emissions from 32 heavy-duty vehicles operating on chassis dynamometers. Vehicles tested included: eighteen gasoline and twelve diesel trucks with gross vehicle weights (GVW) ranging from 8,000 to 35,000 kilograms and two diesel buses. These vehicles were evaluated in the as-received condition.

Test Procedures - Inertia weights were selected to simulate an empty vehicle, 50 percent payload, and full rated GVW. In the case of truck-tractors, the empty weight included the weight of a typical trailer. A road load power setting was then determined experimentally on the road for each vehicle at each weight.

The vehicle was then installed onto the chassis dynamometer for the exhaust emission determinations. All determinations were made with the vehicle and dynamometer at normal operating temperatures. Each vehicle was evaluated, at three different inertia weights and appropriate road-load power settings, over modes and cycles including: idle and steady state speeds, acceleration-deceleration (in a sinusoidal pattern) and driving cycles (to simulate urban and suburban driving conditions). In four vehicles, the preceding modes and driving cycles were repeated and additional driving cycles were run. Chassis version nine-mode tests were conducted on all gasoline vehicles and chassis version thirteen-mode tests were conducted on all diesel vehicles.

For the gasoline vehicles, a constant volume sampling (heavy-duty version) procedure was used to gather the emissions. In addition to the emission measurements by the bag technique, emission levels and associated operating parameters were measured and recorded continuously. After the tests, exhaust hydrocarbon and carbon monoxide measurements were made at idle using a portable garage-type analyzer. The continuous recorded emission levels were processed into emission and fuel rates on an every second basis.

For the diesel vehicles, the emission in the raw exhaust, along with air flow and associated operating parameters, were measured and recorded continuously. These values were then processed into emission and fuel rates on an every second basis. Average emission rates for the cycle were determined

for this second by second data. With some exceptions, the emissions instrumentation and calculation procedures were similar to those used in the thirteen-mode diesel certification procedure.

Results - A large data base of exhaust emission and fuel rates, under various simulated driving conditions, were collected and processed on 32 heavy-duty vehicles. This data is currently undergoing analysis under a separate data analysis contract.

This project is also felt to have made a significant contribution to the state-of-the-art relative to the operation of high GVW vehicles on a chassis dynamometer. In addition, the findings in this project have contributed to the study, currently being made, of the application of the chemiluminescence instrument to the measurement of raw exhaust gases from piston engines.

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15. Environmental Protection Agency, "Recommended Heavy Duty Gasoline Instrumentati on and Test Procedures, July 11, 1975.

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APPENDIX A

GENERAL INFORMATION

A-1 Composition of Fuels Used
A-2 Computer Tape Test Record and Data Format
A-3 Examples of Test Data Computer Output

APPENDIX A-1
COMPOSITION OF FUELS USED

Fuel Type / Fuel Code	Gasoline EM-234-F	Type 2-D Diesel Fuel EM-238-F	Type 1-D Diesel Fuel* EM-226-F
Property			
Gravity, °API	57.4	36.1	44.3
RVP, lbs	8.5	-	-
Sulfur, % by wt.	0.002	0.30	0.10
Distillation, °F			
Initial Boiling Point	88	380	336
End Point	386	659	511
5%	116	400	-
10%	134	416	366
20%	164	432	-
30%	186	450	-
40%	206	469	-
50%	222	496	399
60%	238	519	-
70%	256	543	-
80%	282	566	-
90%	320	600	459
95%	338	636	-
Recovery, %	98.0	99.0	99.0
Residue, %	1.0	1.0	1.0
Loss, %	1.0	0.0	0.0
Paraffins, %	-	-	-
Olefins, %	7.0	-	2.5
Aromatics, %	29.0	28.5	15.1
Calculated Cetane No.	-	49.0	48.6
Viscosity, SU S, °F	-	34.5	31.5
Viscosity, CS, °F	-	2.5	1.67
Flash, °F	-	170	115

*Used only in Bus 31

APPENDIX A-2. COMPUTER TAPE TEST RECORD AND DATA FORMAT

RECORD SHEET	Column	Format
Contractor Code (1 = SwRI)	1	I 1
Contract (01 = This Contract)	2-3	I 2
Truck Number (Sequential starting with 001)	4-6	I 3
Test Series Number (0 = No weight for 9-mode 1 = empty weight 2 = half payload 3 = rated GCW)	7-8	I 2
Test (0 = Standard 1 = Alternate Driving Cycles)	9	I 1
Run No. (1 = Standard 2 = Repeat)	10	I 1
Record Number (001 for this record)	11-13	I 3
Date of Test (Day, Day, Month, Month, Year, Year)	14-19	I 6
Model Year	20-21	I 2
Type of fuel (1 = gas 2 = diesel 3 = other)	22	I 1
GVW	23-27	I 5
No. of axles (see attached coding sheet)	28	I 1
Body style (see attached coding sheet)	29-30	I 2
Mileage	31-36	I 6
Usage of vehicle (see attached coding sheet)	37-38	I 2
Test Weight	39-44	I 5
Last Tune-up (Day, Day, Month, Month, Year, Year)	45-50	I 6
Tuned before test (1 = Yes, 2 = No)	51	I 1
Percent CO Idle	52-55	F 4.1
PPM Hexane Idle	52-59	I 4
Engine serial number	60-75	A 16
Engine type (V-8, I-6, etc.)		

APPENDIX A-2 (Cont'd.) COMPUTER TAPE TEST RECORD AND DATA FORMAT

	Column	Format
Manufacturer (see attached coding sheet)	79-80	I 2
Engine size (cubic inches)	81-83	I 3
Hp rating at rated RPM	84-86	I 3
Rated RPM	87-90	I 4
Carburetor barrels	91	I 1
Transmission (No. of gears)	92-93	I 2
Axle (No. of ratios)	94	I 1
Tire size	95-102	A 8
As received idle rpm	103-106	I 4
As received dwell	107-108	I 2
As received timing (+ = BTDC, - = ATDC)	109-111	A 3
Tuned idle RPM	112-115	I 4
Tuned dwell	116-117	I 2
Tuned timing	118-120	A 3

APPENDIX A-2 (Cont'd.) COMPUTER TAPE TEST RECORD AND DATA FORMAT

CODING SHEET

Code	No. of Axles
1	two axle truck
2	three axle truck
3	four axle combination (2 axles on truck and 2 on full trailer)
4	three axle combination
5	four axle combination (2 axles on tractor and 2 on trailer)
6	four axle combination (3 axles on tractor and 1 on trailer)
7	five axle combination (3 axles on tractor and 2 on trailer)
8	six axle combination (3 axles on tractor, 1 on trailer, and 2 on full trailer)
9	Other
blank	Not answered

Code	Usage of Vehicle
01	Agriculture
02	Forestry
03	Mining
04	Construction
05	Manufacturing
06	Wholesale and/or Retail
07	For-hire
08	Personal transportation
09	Utilities
10	Services
11	Other
blank	Not answered

Code	Body Style
01	Pickup, panel, multi-stop, walk-in
02	Platform with added device
03	Other platform
04	Cattlerack
05	Insulated non-refrigerated van
06	Insulated refrigerated van
07	Furniture van
08	Open top van
09	All other enclosed vans
10	Beverage
11	Utility
12	Garbage or refuse
13	Winch or crane other than wrecker
14	Wrecker
15	Pole or logging
16	Auto transport
20	Dump truck or combination
30	Tank truck or combination (liquids)
40	Tank truck or combination (dry bulk)
50	Concrete mixer
60	Other

Code	Manufacturer
1	Chevrolet
2	Ford
3	International Harvester
4	GMC
5	Dodge
6	Willis
7	Mack
8	White Series (Freightline, Reo, etc.)
9	Caterpillar
10	Cummins
11	Detroit Diesel
12	All others

APPENDIX A-2. (Cont'd.) COMPUTER TAPE TEST RECORD AND DATA FORMAT

DATA FORMAT FOR ALL TESTS	Column	Format
Contractor Code (1 = SwRI)	1	I 1
Contract (01)	2-3	I 2
Truck Number (Sequential starting with 001)	4-6	I 3
Test Series Number (0 = nine-mode 1 = empty weight 2 = half payload 3 = rated GCW)	7-8	I 2
Type of Test (1 = 9 mode FTP 4 = Steady State 5 = Experimental (Dr. Cy.) 6 = Other (Sinu.)	9	I 1
Test Number Series	10	I 1
Record Number (002 to 0XX for each load)	11-13	I 3
HC, grams/min	14-19	F6.2
CO, grams/min	20-25	F6.1
CO_2, grams/min	26-32	F7.1
NO_x, grams/min	33-38	F6.2
Fuel Consumption (See Note 1)	39-44	F6.2

9-MODE OR 13-MODE FTP

No additions

STEADY STATE		
Manifold Vacuum, "Hg; Rail Pressure, psi or Rack, %	45-49	F5.1
MPH	50-51	I 2
RPM	52-55	I 4

SINUSOIDAL		
Period (Reciprocal of Frequency), Seconds	45-49	F5.1
MPH	50-51*	I 2
Amplitude, mph	52-53	I 2

DRIVING CYCLE		
Distance, miles	53-58	F6.2
Time, seconds	59-64	F6.1

*-99 Inserted when test has data missing

Notes: 1. All Fuel Consumption in litre/100 km except idle in ml/min.

APPENDIX A-2 (Cont'd.) COMPUTER TAPE TEST RECORD AND DATA FORMAT

FORMAT COMPOSITE	7-8	9	10	11-13*
Record Sheet:	00	1	1	001
9-Mode FTP:*				
Bag Average	00	1	0	002*
Modal Composite Avg.	00	1	0	003*
Modal Values (Modes 1-9)	00	1	1-9	004-012**
WOT Average		1	7	013**
Record Sheet:	01, 02 & 03	1	1	001
Steady State:				
00	"	4	1	002
05	"	4	2	003
10	"	4	3	004
15	"	4	4	(Sequentially Numbered)
20	"	4	5	
30	"	4	6	
40	"	4	7	
55	"	4	8	
Sinusoidal:				
20± 5	"	6	1	
30± 5	"	6	2	
40± 5	"	6	3	
20± 2	"	6	4	
30± 2	"	6	4	
40± 2	"	6	6	
Driving Cycle:				
05 Avg.	"	5	1	
10 Avg.	"	5	2	
15 Avg.	"	5	3	
20 Avg.	"	5	4	
Alternate Driving Cycle:				
As required	01, 02 & 03	5	1 to 4	002 to 005

*For 13 Mode Results on Buses 31 and 32: 002 = Composite Results in g/bhp-hr, 003 = Composite Results in g/min

**004-016 (Column 10 goes from 1 to 9 then 0 to 3)

APPENDIX A-2 (Cont'd.) COMPUTER TAPE TEST RECORD AND DATA FORMAT

FORMAT FOR CONTINUOUS DATA TAPES		Character	Format
NSWRI	Contractor Code	1	I 1
KONTR	Contract	2-3	I 2
NOTRK	Truck Number	4-6	I 3
LOAD	Test Series Number	7-8	I 2
ILTYP	Type of Test	9	I 1
ITSEQ	Test Number Series	10	I 1
NREC	Record Number	11-13	I 3
MODE	Mode	14	I 1
MPH	Average Speed (MPH)*	15-16*	I 2
ISC	Time in Seconds	17-20	I 4
ARPM	Engine RPM	21-25	F5.0
AVAC	Vacuum, "Hg; Rack, %; or Rail, psi	26-30	F5.1
AMPH	Vehicle speed in mph	31-34	F4.1
AHC	HC in g/min	35-41	F7.2
ACO	CO in g/min	42-49	F8.2
ACO_2	CO_2 in g/min	50-57	F8.1
ANO_x	NO_x in g/min	58-65	F8.2
FUEL	Fuel in g/min	66-72	F7.1
ISC	Time in Seconds	73-76	I 4
ARPM	Engine RPM	77-81	F5.0

APPENDIX A-2 (Cont'd.) COMPUTER TAPE TEST RECORD AND DATA FORMAT

AVAC	Manifold Vacuum or rack or rail position	82-86	F5.1
AMPH	Vehicle speed	87-90	F4.1
AHC	HC	91-97	F7.2
ACO	CO	98-105	F8.2
ACO_2	CO_2	106-113	F8.1
ANO_x	NO_x	114-121	F8.2
FUEL	Fuel	122-128	F7.1

---

*Columns 15 and 16 are labeled as follows whenever the test data on the tape is judged not useable as recorded on this tape or the values differ from the composite bag data

Problem Description	Data Not Useable	Data Differs
TIME	90	80
RPM	91	81
VAC, RACK OR RAIL	92	82
MPH	93	83
HC	94	84
CO	95	85
CO_2 & FUEL	96	85
NO_x	97	87
VARIOUS	98	88
TEST VOID	99	--

Data Not Useable - Serious problem(s), emissions differ from composite values by more than 20%, MPH or RPM or VAC by more than 10%, or TIME by more than 5%.

Data Differs - Emissions differ from composite values by 10 to 20% or MPH or RPM by 5 to 10%.

APPENDIX A-3. EXAMPLES OF TEST DATA COMPUTER OUTPUT

EXHAUST EMISSIONS FROM TRUCKS 11-4133
VEHICLE NUMBER 28

DATE 12/75		TEST NO. 81
MODEL 1967 DODGE D3DIE		ENGINE 12.18 LITRE I6
DRIVER JGC	TEST WT. 7258. KG	GVW 18824 KG
WET BULB TEMP 14. C	DRY BULB TEMP 18. C	REL. HUM. 61.3 PCT
SPEC. HUM. 8.2 GRAM/KG	BARO. 743.7 MM HG	MEASURED FUEL .00 KG

RUN DURATION	250.	SECONDS	4.17	MINUTES
RUN DISTANCE	2.266	KILOMETRES	1.408	MILES
AVERAGE SPEED	32.03	KM/HOUR	20.28	MPH
AVG. AIR FLOW	12812.	GRAMS/MINUTE		

HC GRAMS/MIN	1.82
CO GRAMS/MIN	6.1
CO2 GRAMS/MIN	576.
NOX GRAMS/MIN	4.84

HC GRAMS/KG OF FUEL	9.80
CO GRAMS/KG OF FUEL	32.7
CO2 GRAMS/KG OF FUEL	3108.
NOX GRAMS/KG OF FUEL	26.12

HC GRAMS/KILOMETRE	3.34
CO GRAMS/KILOMETRE	11.2
CO2 GRAMS/KILOMETRE	1060.
NOX GRAMS/KILOMETRE	8.91

C. B. FUEL CONSUMPTION 185.47 GRAMS/MIN
CARBON BALANCE FUEL CONSUMPTION 40.6 LITRE/100KM
ESTIMATED TOTAL FUEL WT. FROM CARBON BALANCE 772.81 GRAMS

APPENDIX A-3. EXAMPLES OF TEST DATA COMPUTER OUTPUT

EXHAUST EMISSIONS FROM TRUCKS 11-4133
VEHICLE NUMBER 17

DATE 6/20/75	TIME 1330 HRS	TEST NO. 11
MODEL 1975 IHC CAL D2GAS	00 STEADY STATE	ENGINE 5.65LITRE V8
DRIVER EG	TEST WT. 7711 KG	GVW 7938 KG
WET BULB TEMP 21 C	DRY BULB TEMP 29 C	REL. HUM. 46.8 PCT
SPEC. HUM. 11.9 GRAM/KG	BARO. 742.9 MM HG	MEASURED FUEL 0.00 KG

RUN DURATION 2.00 MINUTES
BLOWER INLET PRESS. 355.6 MM H2O
BLOWER DIF. PRESS. 508.0 MM H2O
BLOWER INLET TEMP. 35 DEG C
BLOWER REVOLUTIONS 3312
BLOWER CU. CM/REV 17707

BAG RESULTS

	METER READINGS	SCALE	VALUE
HC SAMPLE	5.0	1	25 PPM
HC BACKGRD	2.5	1	13 PPM
CO SAMPLE	2.2	3	56 PPM
CO BACKGRD	1.5	3	38 PPM
CO2 SAMPLE	14.2	3	.23 PCT
CO2 BACKGRD	3.0	3	.05 PCT
NOX SAMPLE	11.5	1	1 PPM
NOX BACKGRD	3.5	1	0 PPM

HC CONCENTRATION PPM	13
CO CONCENTRATION PPM	18
CO2 CONCENTRATION PCT	.18
NOX CONCENTRATION PPM	.8
HC MASS (GRAMS)	.39
CO MASS (GRAMS)	1.09
CO2 MASS (GRAMS)	175.46
NOX MASS (GRAMS)	.08

HC GRAMS/KILOMETRE	R
CO GRAMS/KILOMETRE	R
CO2 GRAMS/KILOMETRE	R
NOX GRAMS/KILOMETRE	R

HC GRAMS/KG OF FUEL	6.86	HC GRAMS/MIN	.19
CO GRAMS/KG OF FUEL	19.4	CO GRAMS/MIN	.5
CO2 GRAMS/KG OF FUEL	3117	CO2 GRAMS/MIN	88
NOX GRAMS/KG OF FUEL	1.50	NOX GRAMS/MIN	.04

TOTAL CARBON 48.69 GRAMS
ESTIMATED FUEL WT. FROM CARBON BALANCE 56.29 GRAMS
CARBON BALANCE FUEL CONSUMPTION FROM ROLL COUNTS R LITRE/100KM
ESTIMATED FUEL CONSUMPTION GRAMS/MIN 28.14
BLOWER TEST VOLUME 52.62 STD. CU. METERS

APPENDIX A-3. EXAMPLES OF TEST DATA COMPUTER OUTPUT

EXHAUST EMISSIONS FROM TRUCKS 11-4133
VEHICLE NUMBER 28

```
DATE 12/75                                             TEST NO. 78
MODEL 1967 DODGE D301E    55 STEADY STATE              ENGINE 12.18 LITRE I6
DRIVER AL RKH             TEST WT. 7258 KG             GVW 18824 KG
WET BULB TEMP 18 C        DRY BULB TEMP 22 C           REL. HUM. 72.8 PCT
SPEC. HUM. 12.1 GRAM/KG   BARO. 742.7 MM HG            MEASURED FUEL 0.00 KG

  RUN DURATION        120 SECONDS          2.00 MINUTES
  RUN DISTANCE      2.961 KILOMETRES       1.840 MILES
  AVERAGE SPEED     88.82 KM/HOUR          55.20 MPH
  AVG. AIR FLOW     11681 GRAMS/MINUTE

  HC  GRAMS/MIN    1.58
  CO  GRAMS/MIN     9.9
  CO2 GRAMS/MIN    1015
  NOX GRAMS/MIN    9.40

  HC  GRAMS/KG OF FUEL    4.88
  CO  GRAMS/KG OF FUEL    30.6
  CO2 GRAMS/KG OF FUEL    3127
  NOX GRAMS/KG OF FUEL   28.94

  HC  GRAMS/KILOMETRE     1.07
  CO  GRAMS/KILOMETRE      6.7
  CO2 GRAMS/KILOMETRE      686
  NOX GRAMS/KILOMETRE     6.35

  C. B. FUEL CONSUMPTION   324.66 GRAMS/MIN
  CARBON BALANCE FUEL CONSUMPTION       25.0 LITRE/100KM
  ESTIMATED TOTAL FUEL WT. FROM CARBON BALANCE    649.32 GRAMS
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APPENDIX B

DESCRIPTION OF VEHICLES AND DRIVING CYCLES

B-1 Gasoline Trucks Evaluated
B-2 Diesel Vehicles Evaluated
B-3 Description of Driving Cycles

APPENDIX B-1. GASOLINE TRUCKS EVALUATED

				Truck					Engine	
No.	Year	Make	Body Style	Desc.**	Mileage	Application	CVW	Source	CID inches^3	Litres
01	1970	Dodge	Van	D2	62,486	Other	16,500	SwRI	318	5.22
02	1974	Chev	Van	D2	3,068	Rental	23,000	Hertz	366	6.00
03	1973	Ford	Van	D2	25,296	Rental	23,000	Hertz	361	5.92
04	1975	IHC	Van	D2	7,214	Rental	22,500	ABC	345	5.66
05	1965	Chev	Van	D2	5,239	Delivery	19,500	Basse Truck Lines	292	4.79
06	1974	Ford	Van	D2	19,002	Delivery	23,160	Ryder	391	6.41
07	1974	IHC	Van	D2	13,559	Delivery	23,660	Ryder	392	6.42
08	1967	Dodge	Van	D2	48,299	Hauling	23,000	Yellow Freight	361	5.92
09	1971	IHC	Van (Refr.)	D3	80,000	Meat Hauling	40,000	L&H Packing	345	5.66
10	1974	IHC	Tractor	TT2A	8,644	Rental	56,000	ABC	478	7.83
11	1974	Chev	Flatbed	D3	17,994	Construction	38,500	de Leon & Sons	366	6.00
12	1972	Ford	Tractor	TT2A	47,630	Rental	45,000	ABC	477	7.82
13	1974	GMC	Tractor	TT2A	8,472	Rental	45,000	ABC	427	7.00
14	1969	Ford	Tractor	TT2A	100,000	Delivery	43,500	Royal Crown	391	6.41
15	1974	GMC	Dump Tr.	D3	10,945	Construction	44,500	Maldonado	427	7.00
16	1966	Chev	Dump Tr.	D3	100,000	Dirt Hauling	42,000	Smitty's Trucking	366	6.00
17	1975	IHC Cal.	Van	D2	4,120	Rental	17,500	California	345	5.66
18	1975	Ford Cal.	Tractor	TT2A	1,654	Leasing	44,000	California	389	6.38

**See Appendix B-2 for definition of Desc.

APPENDIX B-2, DIESEL VEHICLES EVALUATED

Truck									Engine			
No.	Year	Make	Body Style	Desc.**	Mileage	Application	GVW	Source	Make	Model	Serial No.	Date of Mfg.
19	1972	Ford	Van	D2	71,500	Rental	22,000	ABC	Cat.	1150	96B8174	7-72
20	1975	Ford*	Tractor	TT	1,856	Leasing	76,500	Coast	Cummins	NTCC-350	10495890	5-75
21	1973	IH	Tractor	TT	174,550	Rental	76,000	Ryder	Cummins	NTC-290R	10335631	4-73
22	1971	Mack	Tractor	TT	216,022	Leasing	76,500	Wood	Mack	ENDT-675	5U1076	9-70
23	1972	IH	Tractor	TT	132,391	Rental	76,500	ABC	D. D.	8V-71N	8VA178757	4-72
24	1975	Ford	Tractor	TT	12,635	Leasing	76,500	Red Mac	D. D.	8V-71N	8VA302505	9-74
25	1975	IH	Tractor	TT	19,948	Rental	76,500	Ryder	Cummins	NTC-290R	10472968	12-74
26	1974	Ford	Tractor	TT2A	41,478	Leasing	49,800	Red Mac	D. D.	6L-71N	6A0290231	10-73
27	1972	IH	Tractor	TT	331,372	Leasing	76,500	R&K	Cummins	V8-903	10226499***	-
28	1967	Dodge	Dump truck	D3	-	Gravel Hauling	41,500	Bailey	Cummins	NH-220	359-----***	-
29	1975	IH	Van	D2	1,793	Rental	25,160	ABC	Cat.	3208	40S11191	3-75
30	1975	IH	Refr. Van	D3	10,154	Meat transport	47,800	Roegelein	D. D.	6V-53N	06D121342	2-75
31	1972	GMC	Bus	Bus	27,008	City bus		S.A. Transit	D.D.	6V-71N	3T65111	8-71
32	1975	MCI	MC Bus	Bus	6,850	Intercity Bus		S.A. Transit	D.D.	8V-71N	8VA326961	7-75

*Meets California Emission Requirements.

**D2 - Single unit truck - 2 axles
D3 - Tandem axle single unit truck - 3 axles
TT2A - Tractor and trailer - 3 axles total
TT - Tandem axle tractor and trailer - 5 axles total

***Date and serial number are questionable.

APPENDIX B-3
DESCRIPTION OF DRIVING CYCLES

Vehicle					
No.	Desc.	Desc.	Number	Duration, seconds	Avg. Speed, km/hr
1-8, 17,	D2GAS	05	180622075	576	8.50
17 Repeat		10	925077131	580	16.53
		15	1874219417	603	24.67
		20	1638863867	637	33.63
17 Alt.	D2GAS	05	1162034257	651	7.65
	ALTERNATE	10	334486913	590	15.86
		15	2012212305	611	24.23
		20	1674619155	601	33.30
09, 11,	D3GAS	05	1245377313	714	8.24
15, 16		10	532860011	623	16.11
		15	1566793097	644	24.01
		20	400624235	736	31.78
10, 12,	TTGAS	05	1031942939	777	8.23
13, 14,		10	2058474153	656	16.79
18,		15	2109872435	727	24.01
18 Repeat		20	380668241	753	32.78
18	TTGAS	05	310823643	699	7.85
Alt.	ALTERNATE	10	1718373307	676	16.65
		15	1204338883	786	23.67
		20	1188064411	745	31.39
19, 29	D2DIE	05	390741665	652	8.91
		10	1527266763	675	15.56
		15	1137788723	779	23.51
		20	555005187	772	33.17
28, 30	D3DIE	05	882238513	791	8.04
		10	202042971	761	15.65
		15	743630625	641	24.09
		20	1200794289	734	31.82
20, 21,	TTDIE	05	767793819	827	8.22
22, 23		10	802433547	776	16.50
24, 24 Repeat		15	605752003	697	24.00
25, 25 Repeat		20	462050771	669	31.32
26, 27					
24 Alt.	TTDIE	05	1624531969	824	7.63
	ALTERNATE	10	2112632739	782	16.49
	#1	15	201419497	749	24.75
		20	999014859	668	31.34
25	TTDIE	05	1640346049	829	8.62
Alt.	ALTERNATE	10	1143551683	775	15.83
	#2	15	1790747657	708	24.33
		20	51384161	749	31.52
31, 32	BUS DIE	05	2110306831	1055	8.18
		10	439674415	1050	16.01
		15	2145058671	1023	23.99
		20	1263137477	931	31.00

APPENDIX C

GASOLINE TRUCK RESULTS

C-1 through C-18 Summarized Results of Eighteen Gasoline Trucks

C-19 Gasoline Truck Idle CO and HC

C-20 Modified Nine-Mode FTP Results Summary

C-21 Modal Modified Nine-Mode FTP Results

APPENDIX C-1

TABLE 01-1. TRUCK 001 SUMMARY - GRAMS/KILOMETRE

1970 Dodge D2GAS 5.21 Litre V8 GVW 7484 KG Project 11-4133

Test	EMPTY LOAD - 3401 KG					HALF LOAD - 5261 KG					FULL LOAD - 7348 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	1.13	12.3	2594	2.48	110.59	1.10	12.6	2261	2.07	96.52	0.76	12.9	2394	2.19	102.12
10 SS	0.28	5.3	1202	1.27	51.19	0.46	8.5	1210	1.30	51.75	0.39	6.5	1214	1.23	51.77
15 SS	0.66	3.5	699	0.74	29.86	0.99	5.7	706	0.71	30.36	0.79	4.3	715	0.81	30.59
20 SS	1.20	4.6	656	1.98	28.17	0.64	4.7	639	1.58	27.40	0.64	4.2	669	2.16	28.65
30 SS	0.86	2.4	452	3.88	19.36	0.97	3.8	478	3.73	20.57	1.03	3.1	490	4.00	21.04
40 SS	0.86	3.3	533	6.39	22.87	0.95	4.3	534	5.90	22.97	0.86	4.1	611	7.74	26.21
55 SS	1.04	20.3	691	6.31	30.70	1.15	23.4	710	5.72	31.72	1.95	74.3	659	4.53	33.03
20±5	11.54	46.6	594	4.97	29.75	14.95	58.4	604	5.43	31.41	14.48	65.3	717	7.76	36.56
30±5	4.27	31.6	424	3.03	20.57	7.62	53.3	422	2.91	22.38	7.42	65.8	476	4.76	25.48
40±5	2.28	35.7	534	5.41	24.91	2.73	43.6	544	4.40	26.24	1.75	50.4	546	5.74	26.67
20±2	2.90	27.8	606	4.04	27.51	5.95	36.5	538	4.30	25.62	6.55	35.9	519	3.53	24.89
30±2	1.68	20.0	389	3.58	18.01	2.05	26.8	423	4.20	19.69	2.13	28.7	430	3.42	20.09
40±2	2.39	32.4	519	7.22	24.10	2.40	39.8	505	7.05	23.98	2.82	75.2	547	5.32	28.13
05 AVG.	10.74	133.7	852	2.70	46.31	10.43	140.7	839	3.46	45.60	12.20	128.1	1094	4.07	56.37
10 AVG.	11.84	148.2	652	3.22	38.96	13.96	199.6	703	3.89	44.27	13.42	153.7	803	4.81	45.95
15 AVG.	5.93	77.5	574	4.84	30.20	6.73	102.0	604	4.63	32.76	8.06	86.5	684	5.80	35.74
20 AVG.	6.10	98.6	585	4.38	32.08	7.03	166.2	622	3.86	37.76	7.30	119.0	673	4.98	37.34

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX C-1 (Cont'd.)

TABLE 01-2. TRUCK 001 SUMMARY - GRAMS/MINUTE

1970 Dodge D2GAS 5.21 Litre V8 GVW 7484 KG Project 11-4133

Test	EMPTY LOAD - 3401 KG					HALF LOAD - 5261 KG					FULL LOAD - 7348 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.84	13.1	71	0.02	29.61	1.08	7.1	75	0.05	28.35	0.97	18.2	76	0.02	33.85
05 SS	0.15	1.7	356	0.34	113.30	0.15	1.7	310	0.28	98.89	0.10	1.8	327	0.30	104.27
10 SS	0.08	1.4	319	0.34	101.38	0.12	2.3	325	0.35	103.71	0.10	1.7	322	0.33	102.53
15 SS	0.26	1.4	280	0.30	89.39	0.40	2.3	283	0.28	90.87	0.32	1.7	287	0.33	91.65
20 SS	0.64	2.5	352	1.07	113.07	0.35	2.6	346	0.86	110.79	0.35	2.3	361	1.17	115.31
30 SS	0.70	1.9	365	3.14	116.94	0.78	3.1	385	3.01	123.68	0.83	2.5	394	3.21	126.26
40 SS	0.92	3.5	572	6.85	183.15	1.02	4.7	573	6.33	184.14	0.91	4.3	647	8.20	207.27
55 SS	1.53	29.8	1012	9.24	335.75	1.69	34.4	1045	8.42	348.35	3.01	114.3	1014	6.97	379.46
20±5	5.98	24.2	308	2.58	115.17	7.97	31.1	322	2.90	124.98	7.73	34.9	383	4.14	145.77
30±5	3.34	24.7	332	2.37	120.21	6.07	42.4	335	2.32	132.89	5.97	52.9	383	3.83	152.98
40±5	2.40	37.6	562	5.69	195.82	2.88	46.0	575	4.65	207.01	1.88	54.1	586	6.15	213.48
20±2	1.54	14.8	322	2.14	108.99	3.18	19.4	287	2.29	102.01	3.52	19.3	279	1.90	99.92
30±2	1.33	15.8	306	2.82	105.82	1.63	21.3	336	3.33	116.57	1.71	23.1	347	2.76	121.00
40±2	2.50	33.9	542	7.54	187.95	2.52	41.8	530	7.39	187.86	3.03	80.9	589	5.73	225.87
05 AVG.	1.49	18.6	118	0.37	48.03	1.45	19.5	117	0.48	47.31	1.72	18.0	154	0.57	59.24
10 AVG.	3.21	40.3	177	0.87	79.00	3.74	53.5	188	1.04	88.57	3.70	42.4	222	1.33	94.63
15 AVG.	2.37	31.0	230	1.94	90.20	2.71	41.0	243	1.86	98.30	3.37	36.1	286	2.42	111.45
20 AVG.	3.26	52.6	312	2.34	127.87	3.81	90.2	337	2.09	152.99	4.08	66.5	376	2.78	155.80
9-FTP						3.34	33.1	324	3.32	121.95					
9-FTP						3.28	33.2	329	2.96	123.40					
9-WOT						6.56	248.1	828	2.84	390.98					
9-WOT						5.91	237.6	823	2.66	383.22					

*Fuel Consumption in Grams/Minute

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-1 (Cont'd.)

TABLE 01-3. TRUCK 001 SUMMARY - GRAMS/KILOGRAM OF FUEL

1970 Dodge D2GAS 5.21 Litre V8 GVW 7484 KG Project 11-4133

Test	EMPTY LOAD - 3401 KG				HALF LOAD - 52[illegible]1 KG				FULL LOAD - 7348 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	28.43	441.8	2385	0.55	37.99	250.5	2655	1.66	28.79	538.5	2232	0.67
05 SS	1.36	14.9	3142	3.01	1.53	17.4	3137	2.87	1.00	16.9	3140	2.87
10 SS	0.74	14.0	3145	3.31	1.20	22.0	3131	3.36	1.00	16.9	3140	3.19
15 SS	2.94	15.6	3136	3.33	4.38	25.0	3116	3.13	3.47	18.7	3129	3.55
20 SS	5.68	21.8	3117	9.43	3.12	23.1	3123	7.72	3.01	19.6	3129	10.11
30 SS	5.94	16.4	3125	26.86	6.30	24.9	3110	24.31	6.57	20.0	3117	25.44
40 SS	5.02	19.2	3123	37.41	5.53	25.3	3112	34.37	4.39	20.9	3123	39.54
55 SS	4.56	88.7	3016	27.52	4.84	98.6	2999	24.17	7.93	301.2	2671	18.36
20±5	51.95	209.7	2675	22.39	63.74	248.8	2576	23.17	53.04	239.4	2625	28.42
30±5	27.78	205.8	2758	19.74	45.64	319.0	2524	17.45	39.00	345.6	2503	25.03
40±5	12.27	191.8	2871	29.07	13.93	222.3	2776	22.44	8.81	253.2	2744	28.81
20±2	14.12	135.5	2953	19.67	31.13	190.7	2812	22.49	35.22	193.1	2795	18.97
30±2	12.52	149.0	2896	26.63	13.95	182.5	2880	28.56	14.17	191.3	2865	22.81
40±2	13.31	180.2	2885	40.12	13.40	222.5	2819	39.36	13.42	358.1	2606	25.35
05 AVG.	31.05	386.6	2463	7.80	30.63	413.1	2464	10.17	28.98	304.3	2599	9.68
10 AVG.	40.69	509.5	2240	11.05	42.23	603.8	2127	11.78	39.11	448.1	2341	14.03
15 AVG.	26.28	343.6	2546	21.47	27.53	417.2	2467	18.93	30.20	32[illegible].0	2565	21.72
20 AVG.	25.48	411.6	2442	18.29	24.93	589.5	2205	13.68	26.20	42[illegible].0	2415	17.86
9-FTP					27.41	271.1	2657	27.21				
9-FTP					26.62	268.9	2662	24.02				
9-WOT					16.77	634.7	2119	7.25				
9-WOT					15.42	620.0	2146	6.94				

APPENDIX C-1 (Cont'd.)

TABLE 01-4. TRUCK 001 SUMMARY - OPERATING DATA

1970 Dodge D2GAS 5.21 Litre V8 GVW 7484 KG Project 11-4133

	EMPTY LOAD - 3401 KG			HALF LOAD - 5261 KG			FULL LOAD - 7348 KG		
Test Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	750	20.8	41	700	21.0	11	750	20.8
05 SS	72	2275	19.0	42	2325	19.3	12	2325	19.1
10 SS	73	2300	18.8	43	2350	19.0	13	2350	18.9
15 SS	74	1700	18.2	44	1725	18.0	14	1725	18.0
20 SS	75	2300	18.3	45	2300	18.2	15	2275	17.5
30 SS	76	2075	16.3	46	2075	15.7	16	2025	15.5
40 SS	77	2700	13.8	47	2700	13.0	17	2700	11.3
55 SS	78	3700	7.8	48	3700	7.2	18	3700	5.5
		Period			Period			Period	
20±5	81	18.0		51	18.0		21	18.0	
30±5	82	32.0		52	32.0		22	32.0	
40±5	83	52.0		53	52.0		23	52.0	
20±2	84	18.0		54	18.0		24	18.0	
30±2	85	32.0		55	32.0		25	32.0	
40±2	86	52.0		56	52.0		26	52.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX C-2

TABLE 02-1. TRUCK 002 SUMMARY - GRAMS/KILOMETRE

1974 Chevrolet D2GAS 6.00 Litre V-8 GVW 10433 KG Project 11-4133

Test Desc.	EMPTY LOAD - 5533 KG					HALF LOAD - 7257 KG					FULL LOAD - 9071 KG				
	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	4.74	196.7	2075	1.58	101.37	6.14	264.5	2053	1.40	105.14	5.09	225.0	2131	1.09	105.66
10 SS	2.81	111.6	1230	1.40	59.78	3.56	153.0	1147	1.00	59.12	2.44	98.5	1230	1.13	58.84
15 SS	2.34	87.7	728	0.86	36.91	2.66	111.8	714	0.67	37.96	2.60	79.7	770	0.90	38.18
20 SS	2.22	69.9	795	1.78	38.53	2.17	68.0	772	1.58	37.42	2.57	74.0	811	1.51	39.53
30 SS	2.48	73.4	593	2.40	30.26	2.47	73.0	559	1.94	28.79	2.78	84.3	638	2.08	32.92
40 SS	2.81	64.0	642	4.97	31.74	2.85	63.7	624	4.51	31.00	3.09	63.5	700	4.95	34.19
55 SS	2.80	46.3	834	10.38	38.71	3.24	60.4	818	9.68	39.00	3.82	84.5	878	7.89	43.24
20±5	11.44	104.7	739	4.92	39.71	15.93	128.8	777	5.11	43.52	15.57	138.2	807	6.89	45.36
30±5	3.59	66.6	511	3.13	26.49	5.13	92.3	550	3.19	30.05	8.12	87.9	500	3.73	28.07
40±5	2.37	54.5	559	4.05	27.56	3.02	81.4	613	4.41	31.70	3.66	109.0	639	5.07	34.74
20±2	2.95	96.9	677	2.05	35.42	7.07	117.1	673	2.49	37.17	7.69	104.3	730	4.08	38.81
30±2	1.96	59.3	535	2.00	26.80	2.50	72.1	544	2.31	28.10	2.74	73.0	586	3.44	29.99
40±2	2.31	57.3	564	3.74	27.94	2.87	69.1	597	4.46	30.20	3.23	72.5	672	6.05	33.64
05 AVG.	17.15	348.2	1260	3.55	78.67	13.93	305.2	1361	2.92	79.65	18.31	333.2	1448	5.55	85.79
10 AVG.	12.57	212.1	991	5.87	57.64	12.85	224.1	1127	6.75	64.25	18.54	301.0	1170	6.93	71.92
15 AVG.	8.17	133.8	733	6.19	40.94	7.57	140.5	764	5.48	42.61	10.32	164.3	832	5.69	47.44
20 AVG.	6.30	116.0	811	7.92	42.83	7.61	127.7	818	6.88	44.08	9.57	202.7	898	6.83	52.69

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed

XX ±Y - Sinusoidal with designated average speed and amplitude

XX AVG. - Driving Cycle with designated average speed

APPENDIX C-2 (Cont'd.)

TABLE 02-2. TRUCK 002 SUMMARY - GRAMS/MINUTE

1974 Chevrolet D2GAS 6.00 Litre V-8 GVW 10433 KG Project 11-4133

Test	EMPTY LOAD - 5533 KG					HALF LOAD - 7257 KG					FULL LOAD - 9071 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	3.07	50.3	82	0.03	53.82	4.09	54.7	82	0.02	57.04	2.32	45.4	109	0.03	59.31
05 SS	0.63	26.3	277	0.21	101.07	0.82	35.3	274	0.19	104.83	0.68	30.0	284	0.15	105.25
10 SS	0.76	30.0	331	0.37	119.91	0.96	41.1	308	0.27	118.61	0.65	26.4	330	0.30	117.72
15 SS	0.94	35.4	294	0.35	111.13	1.07	45.0	288	0.27	114.21	1.05	32.2	311	0.36	114.97
20 SS	1.19	37.6	427	0.96	154.71	1.16	36.5	415	0.85	150.11	1.38	39.8	436	0.81	158.77
30 SS	1.99	59.1	477	1.93	181.94	1.99	58.8	450	1.56	173.10	2.24	68.0	514	1.68	198.22
40 SS	3.02	68.8	689	5.34	254.58	3.06	68.4	670	4.84	248.30	3.32	68.2	751	5.31	274.14
55 SS	4.14	68.5	1234	15.36	427.60	4.78	89.3	1207	14.30	429.93	5.64	124.8	1298	11.66	476.92
20±5	6.10	55.8	394	2.62	158.10	8.59	69.4	419	2.75	175.09	8.60	76.3	445	3.80	186.98
30±5	2.90	53.8	412	2.53	159.71	4.14	74.4	443	2.57	180.97	6.61	71.6	408	3.04	170.75
40±5	2.54	58.4	599	4.34	220.48	3.24	87.6	659	4.74	254.58	3.90	115.9	680	5.39	275.88
20±2	1.61	52.7	368	1.11	143.79	3.80	63.0	362	1.34	149.18	4.22	57.2	401	2.24	159.11
30±2	1.57	47.3	427	1.60	159.70	2.02	58.2	438	1.86	169.20	2.21	59.0	474	2.78	180.99
40±2	2.46	61.2	601	3.99	222.55	3.09	74.3	642	4.79	242.54	3.55	79.8	739	6.65	276.22
05 AVG.	2.45	49.7	180	0.51	83.76	2.00	3.8	195	0.42	85.33	2.72	49.4	215	0.82	95.04
10 AVG.	3.43	57.8	270	1.60	117.26	3.51	61.2	308	1.84	130.97	5.16	83.7	325	1.93	149.37
15 AVG.	3.41	55.8	306	2.58	127.51	3.11	57.6	313	2.25	130.49	4.32	68.8	348	2.38	148.25
20 AVG.	3.43	63.2	442	4.31	174.08	4.10	68.7	440	3.70	177.02	5.18	109.8	486	3.70	213.11
9-FTP						4.47	52.0	422	3.02	163.43					
9-FTP						4.18	52.0	415	3.19	161.05					
9-WOT						10.16	421.1	1074	1.99	557.96					
9-WOT						8.44	380.7	927	2.23	489.68					

*Fuel Consumption in Grams/Minute

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-2 (Cont'd.)

TABLE 02-3. TRUCK 002 SUMMARY - GRAMS/KILOGRAM OF FUEL

1974 Chevrolet D2GAS 6.00 Litre V-8 GVW 10433 KG Project 11-4133

Test Desc.	EMPTY LOAD - 5533 KG				HALF LOAD - 7257 KG				FULL LOAD - 9071 KG			
	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	56.97	934.4	1521	0.60	71.65	959.8	1434	0.37	39.17	765.7	1842	0.12
05 SS	6.26	259.9	2741	2.09	7.82	336.9	2615	1.79	6.45	285.2	2701	1.39
10 SS	6.30	250.1	2756	3.13	8.06	346.6	2599	2.27	5.55	224.2	2800	2.57
15 SS	8.48	318.4	2642	3.11	9.40	394.4	2520	2.36	9.14	279.8	2701	3.16
20 SS	7.72	243.1	2763	6.19	7.76	243.5	2762	5.64	8.72	250.6	2748	5.12
30 SS	10.96	324.8	2624	10.62	11.48	339.4	2600	9.03	11.33	342.9	2595	8.48
40 SS	11.86	270.1	2707	20.98	12.33	275.3	2698	19.50	12.10	248.8	2740	19.38
55 SS	9.69	160.1	2887	35.93	11.11	207.6	2808	33.25	11.83	261.6	2721	24.44
20±5	38.59	353.1	2492	16.60	49.03	396.4	2391	15.71	45.97	408.1	2383	20.34
30±5	18.15	336.7	2583	15.85	22.88	411.3	2451	14.21	38.72	419.6	2387	17.79
40±5	11.51	264.8	2717	19.70	12.74	344.0	2588	18.63	14.12	420.1	2464	19.55
20±2	11.17	366.2	2559	7.74	25.47	422.0	2426	8.98	26.53	359.8	2520	14.09
30±2	9.80	296.2	2673	10.01	11.91	343.8	2591	11.02	12.22	326.1	2618	15.36
40±2	11.07	274.9	2702	17.95	12.75	306.4	2648	19.77	12.86	288.8	2675	24.09
05 AVG.	29.20	592.9	2145	6.04	23.43	513.2	2289	4.92	28.59	520.2	2261	8.67
10 AVG.	29.21	493.0	2302	13.63	26.79	467.2	2350	14.08	34.53	560.6	2179	12.91
15 AVG.	26.72	437.7	2397	20.25	23.80	441.5	2400	17.22	29.13	463.8	2348	16.06
20 AVG.	19.70	362.8	2537	24.75	23.13	388.0	2486	20.90	24.32	515.2	2283	17.37
9-FTP					27.35	317.9	2583	18.51				
9-FTP					25.96	323.1	257[illegible]	19.82				
9-WOT					18.20	754.8	1926	3.58				
9-WOT					17.23	777.4	1893	4.56				

APPENDIX C-2 (Cont'd.)

TABLE 02-4. TRUCK 002 SUMMARY - OPERATING DATA

1974 Chevrolet D2GAS 6.00 Litre V-8 GVW 10433 KG Project 11-4133

	EMPTY LOAD - 5533 KG			HALF LOAD - 7257 KG			FULL LOAD - 9071 KG		
Test Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	680	16.0	41	800	17.0	11	800	17.3
05 SS	72	1800	18.4	42	1800	18.3	12	1800	18.3
10 SS	73	1950	18.0	43	1900	17.8	13	1900	17.0
15 SS	74	1600	17.1	44	1600	16.5	14	1600	16.0
20 SS	75	2150	16.6	45	2150	16.8	15	2150	16.5
30 SS	76	2000	14.0	46	2000	13.8	16	2000	13.0
40 SS	77	2250	12.1	47	2250	11.6	17	2250	10.7
55 SS	78	3175	8.0	48	3150	8.0	18	3150	7.0
		Period			Period			Period	
20±5	81	18.0		51	18.0		21	18.0	
30±5	82	38.0		52	38.0		22	38.0	
40±5	83	60.0		53	60.0		23	60.0	
20±2	84	18.0		54	18.0		24	18.0	
30±2	85	38.0		55	38.0		25	38.0	
40±2	86	60.0		56	60.0		26	60.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX C-3

TABLE 03-1. TRUCK 003 SUMMARY - GRAMS/KILOMETRE

1973 Ford D2GAS 5.92 Litre V-8 GVW 10433 KG Project 11-4133

Test	EMPTY LOAD - 5397 KG					HALF LOAD - 7257 KG					FULL LOAD - 9071 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	3.28	50.9	2208	4.32	97.13	3.63	51.0	2230	5.08	98.11	3.71	68.8	2249	4.33	100.10
10 SS	2.68	52.2	1468	4.97	65.86	2.72	51.6	1448	5.62	64.97	2.74	54.7	1466	4.80	65.96
15 SS	1.83	27.8	785	2.54	35.27	1.85	28.1	798	3.10	35.85	1.78	29.3	818	2.62	36.75
20 SS	2.27	35.9	846	5.11	38.43	2.53	35.5	854	6.14	38.77	2.35	45.3	868	5.37	39.98
30 SS	2.19	32.1	636	6.02	29.29	2.51	36.5	655	7.61	30.45	2.43	37.1	674	6.78	31.25
40 SS	2.27	28.8	583	7.20	26.87	2.48	32.1	614	8.37	28.43	2.47	29.7	654	9.34	29.92
55 SS	2.07	24.8	706	12.75	31.78	1.91	23.7	761	13.51	33.98	1.85	21.9	822	18.26	36.43
20±5	11.23	71.7	857	10.73	42.46	12.24	64.6	963	15.02	46.63	13.63	66.5	1018	15.60	49.28
30±5	3.04	37.8	665	8.59	31.03	5.39	38.6	672	9.68	31.67	7.47	89.2	721	8.24	37.38
40±5	2.25	27.7	603	8.33	27.60	2.06	26.5	634	9.21	28.84	2.94	68.8	671	7.89	33.33
20±2	3.08	68.9	804	5.83	38.94	3.32	54.7	775	7.04	36.84	3.93	60.5	814	7.64	38.92
30±2	2.35	42.7	618	6.09	29.27	1.98	33.8	621	6.70	28.74	2.12	32.2	643	7.65	29.62
40±2	2.09	31.2	505	6.61	23.68	1.83	23.0	530	7.94	24.15	2.03	25.0	592	9.39	26.93
05 AVG.	12.87	229.7	1346	7.75	73.86	14.85	226.7	1322	8.01	72.91	15.51	246.5	1371	9.43	76.38
10 AVG.	12.60	173.1	989	8.09	54.96	15.18	186.5	1048	9.05	58.70	16.67	229.1	1098	8.99	63.84
15 AVG.	7.41	92.6	804	8.02	41.10	7.94	122.9	866	8.42	45.81	8.52	107.0	879	9.27	45.39
20 AVG.	6.47	94.6	758	8.89	39.20	7.75	119.3	877	9.88	46.01	9.49	155.1	854	8.82	47.68

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX C-3 (Cont'd.)

TABLE 03-2. TRUCK 003 SUMMARY - GRAMS/MINUTE

1973 Ford D2GAS 5.92 Litre V-8 GVW 10433 KG Project 11-4133

Test	EMPTY LOAD - 5397 KG					HALF LOAD - 7257 KG					FULL LOAD - 9071 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.79	20.6	86	0.01	38.20	0.77	19.4	82	0.02	36.29	0.92	27.2	77	0.00	38.83
05 SS	0.44	6.8	297	0.58	97.43	0.49	6.9	300	0.68	98.48	0.50	9.2	302	0.58	100.48
10 SS	0.72	14.0	394	1.34	132.12	0.73	13.9	389	1.51	130.40	0.74	14.7	394	1.29	132.36
15 SS	0.74	11.2	316	1.02	106.12	0.75	11.3	322	1.25	107.96	0.72	11.8	330	1.06	110.68
20 SS	1.22	19.3	455	2.75	154.20	1.36	19.1	459	3.30	155.75	1.26	24.4	467	2.89	160.54
30 SS	1.77	25.9	513	4.85	176.40	2.02	29.4	529	6.14	183.43	1.96	29.9	543	5.47	188.24
40 SS	2.44	30.9	628	7.75	215.82	2.67	34.5	661	9.00	228.35	2.66	31.9	703	10.05	240.22
55 SS	3.07	36.7	1045	18.86	350.90	2.82	35.0	1124	19.97	374.89	2.74	32.4	1216	27.01	402.47
20±5	6.03	38.5	460	5.77	170.30	6.59	34.8	518	8.09	187.39	7.33	35.8	548	8.39	197.97
30±5	2.45	30.5	537	6.93	187.03	4.34	31.1	541	7.80	190.53	6.03	72.0	582	6.65	225.33
40±5	2.42	29.8	648	8.96	221.69	2.21	28.5	683	9.92	231.79	3.16	74.0	722	8.49	267.67
20±2	1.66	37.1	432	3.14	156.48	1.78	29.4	417	3.79	147.93	2.10	32.3	435	4.08	155.33
30±2	1.89	34.5	499	4.91	176.29	1.60	27.2	500	5.40	172.94	1.71	26.0	519	6.17	178.52
40±2	2.24	33.6	542	7.10	190.03	1.97	24.8	570	8.55	194.12	2.18	26.9	636	10.09	216.27
05 AVG.	1.80	32.1	118	1.08	76.95	2.09	32.0	186	1.13	76.75	2.22	35.3	196	1.35	81.64
10 AVG.	3.44	47.2	270	2.21	111.96	4.13	50.8	285	2.46	119.34	4.57	62.8	301	2.46	130.57
15 AVG.	3.08	38.5	334	3.34	127.72	3.27	50.6	356	3.47	140.76	3.51	44.0	361	3.81	139.37
20 AVG.	3.57	52.2	418	4.91	161.47	4.19	64.6	474	5.35	185.92	5.14	84.0	463	4.78	192.90
9-FTP						3.00	24.4	386	4.13	137.03					
9-FTP						3.12	24.2	379	4.32	134.54					
9-WOT						7.12	307.8	842	2.27	425.48					
9-WOT						7.51	278.3	854	2.96	415.10					

*Fuel Consumption in Grams/Minute

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-3 (Cont'd.)

TABLE 03-3. TRUCK 003 SUMMARY - GRAMS/KILOGRAM OF FUEL

1973 Ford D2CAS 5.92 Litre V-8 GVW 10433 KG Project 11-4133

Test	EMPTY LOAD - 5397 KG				HALF LOAD - 7257 KG				FULL LOAD - 9071 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	20.76	538.4	2258	0.37	21.13	535.2	2261	0.50	23.61	699.3	1996	0.09
05 SS	4.52	70.2	3045	5.96	4.95	69.6	3044	6.93	4.96	92.0	3009	5.79
10 SS	5.45	106.1	2985	10.11	5.62	106.5	2984	11.59	5.56	111.0	2977	9.75
15 SS	6.94	105.5	2982	9.65	6.92	105.0	2982	11.57	6.48	106.9	2981	9.56
20 SS	7.92	125.0	2948	17.83	8.75	122.5	2949	21.22	7.88	151.7	2906	17.99
30 SS	10.02	146.9	2907	27.51	11.02	160.4	2882	33.45	10.42	158.9	2887	29.05
40 SS	11.32	143.3	2908	35.92	11.69	151.2	2895	39.41	11.06	133.0	2925	41.82
55 SS	8.74	104.5	2978	53.74	7.53	93.3	2999	53.27	6.80	80.5	3021	67.12
20±5	35.42	226.2	2702	33.86	35.15	185.6	2766	43.15	37.03	180.8	2768	42.39
30±5	13.12	163.0	2872	37.06	22.79	163.3	2840	40.93	26.77	319.5	2582	29.51
40±5	10.90	134.2	2924	40.43	9.55	122.9	2946	42.79	11.81	276.4	2698	31.71
20±2	10.59	236.9	2764	20.05	12.05	199.0	2819	25.60	13.52	208.2	2799	26.29
30±2	10.75	195.6	2828	27.87	9.23	157.4	2893	31.20	9.58	145.8	2910	34.58
40±2	11.81	176.7	2854	37.39	10.15	127.5	2937	44.02	10.10	124.4	2942	46.67
05 AVG.	23.34	416.5	2441	14.05	27.28	416.5	2428	14.72	27.21	432.3	2404	16.54
10 AVG.	30.71	421.8	2409	19.73	34.64	425.6	2391	20.65	34.97	480.7	2303	18.87
15 AVG.	24.14	301.7	2619	26.12	23.23	359.5	2531	24.63	25.16	315.7	2594	27.36
20 AVG.	22.11	323.2	2591	30.39	22.55	347.3	2552	28.75	26.65	435.7	2400	24.76
9-FTP					21.90	178.3	2820	30.17				
9-FTP					23.18	179.7	2814	32.10				
9-WOT					16.73	723.4	1980	5.34				
9-WOT					18.09	670.5	2058	7.12				

APPENDIX C-3 (Cont'd.)

TABLE 03-4. TRUCK 003 SUMMARY - OPERATING DATA

1973 Ford D2GAS 5.92 Litre V-8 GVW 10433 KG Project 11-4133

	EMPTY LOAD - 5397 KG			HALF LOAD - 7257 KG			FULL LOAD - 9071 KG		
Test Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	700	18.5	41	700	18.5	11	700	18.5
05 SS	72	1800	19.0	42	1800	19.1	12	1750	19.2
10 SS	73	2200	19.0	43	2200	18.6	13	2200	19.0
15 SS	74	1800	17.8	44	1800	17.6	14	1850	17.2
20 SS	75	2400	17.8	45	2400	17.6	15	2400	17.5
30 SS	76	2350	15.5	46	2400	16.4	16	2350	14.5
40 SS	77	2150	12.0	47	2100	12.7	17	2150	11.0
55 SS	78	2950	7.6	48	2900	8.5	18	2950	4.5
		Period			Period			Period	
20±5	81	18.0		51	18.0		21	18.0	
30±5	82	32.0		52	32.0		22	32.0	
40±5	83	62.0		53	62.0		23	62.0	
20±2	84	18.0		54	18.0		24	18.0	
30±2	85	32.0		55	32.0		25	32.0	
40±2	86	62.0		56	62.0		26	62.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX C-4

TABLE 04-1. TRUCK 004 SUMMARY - GRAMS/KILOMETRE

1975 IHC D2GAS 5.65 Litre V-8 GVW 10206 KG Project 11-4133

Test	EMPTY LOAD - 5261 KG					HALF LOAD - 7257 KG					FULL LOAD - 9071 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	43.16	25.7	1511	2.27	71.35	46.46	19.1	1383	2.91	65.92	4.44	66.4	1616	1.52	73.31
10 SS	2.33	27.4	1012	1.92	44.88	2.87	32.6	956	1.94	42.95	1.14	37.0	1059	2.25	47.37
15 SS	1.76	20.2	636	1.57	28.47	1.87	19.5	640	1.82	28.58	1.33	21.3	643	1.51	28.78
20 SS	1.40	17.6	689	1.57	30.49	1.57	16.2	710	1.87	31.29	1.18	19.1	703	1.56	31.13
30 SS	2.02	22.8	567	2.28	25.75	2.27	21.8	578	2.55	26.19	2.03	17.6	575	2.58	25.73
40 SS	2.59	25.4	540	3.78	24.87	3.10	30.3	597	5.17	27.66	2.91	30.0	583	5.61	27.00
55 SS	3.02	47.0	706	6.69	33.38	3.33	47.6	821	7.31	38.30	3.20	48.5	821	6.67	38.34
20±5	7.87	66.4	813	5.51	39.81	7.76	107.4	891	5.32	45.81	7.42	153.2	954	6.25	51.50
30±5	5.38	31.5	517	3.66	24.66	4.06	53.2	611	4.26	29.92	3.95	88.8	628	4.27	32.97
40±5	2.52	29.7	507	4.18	23.74	2.87	51.9	589	4.29	28.73	3.11	75.1	589	4.58	30.29
20±2	5.02	30.6	636	3.06	29.57	7.13	48.8	656	3.42	31.92	6.29	52.2	709	4.09	34.28
30±2	2.20	19.4	497	3.46	22.58	2.47	29.1	534	2.77	24.82	2.54	28.3	541	4.07	25.09
40±2	2.73	30.9	508	4.84	23.88	3.11	48.4	577	4.56	28.01	3.07	40.0	596	5.63	28.25
05 AVG.	23.52	53.1	1108	3.97	53.49	23.91	84.2	1180	3.99	58.68	16.94	88.0	1222	4.47	59.75
10 AVG.	12.01	112.2	920	4.52	47.92	12.21	141.3	940	4.32	50.74	11.67	176.3	1006	4.42	55.80
15 AVG.	8.80	54.5	739	4.51	36.04	8.55	79.5	762	4.80	38.60	8.95	105.6	805	4.88	42.23
20 AVG.	6.56	78.2	710	6.90	36.08	7.32	127.5	750	5.00	41.13	7.78	158.0	749	4.81	43.17

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX C-4 (Cont'd.)

TABLE 04-2. TRUCK 004 SUMMARY - GRAMS/MINUTE

1975 IHC D2GAS 5.65 Litre V-8 GVW 10206 KG Project 11-4133

Test Desc.	EMPTY LOAD - 5261 KG					HALF LOAD - 7257 KG					FULL LOAD - 9071 KG				
	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	4.09	3.0	69	0.00	27.38	3.16	2.6	71	0.00	26.95	5.00	2.8	62	0.02	25.87
05 SS	5.81	3.5	203	0.31	71.66	6.33	2.6	188	0.40	67.09	0.60	9.0	218	0.20	73.82
10 SS	0.62	7.3	269	0.51	88.96	0.76	8.6	254	0.51	85.06	0.30	9.8	282	0.60	94.12
15 SS	0.70	8.1	255	0.63	85.21	0.75	7.8	257	0.73	85.62	0.54	8.6	259	0.61	86.35
20 SS	0.76	9.5	373	0.85	123.28	0.84	8.7	381	1.00	125.28	0.63	10.3	379	0.84	125.27
30 SS	1.63	18.3	455	1.83	154.40	1.83	17.5	465	2.05	157.18	1.62	14.1	461	2.07	154.04
40 SS	2.77	27.2	578	4.04	198.52	3.31	32.4	638	5.52	220.59	3.12	32.1	624	6.01	215.87
55 SS	4.47	69.7	1048	9.92	369.67	4.90	70.1	1209	10.77	421.01	4.73	71.7	1214	9.86	423.23
20±5	4.22	35.6	436	2.95	159.30	4.17	57.7	478	2.86	183.72	3.98	82.2	512	3.36	206.38
30±5	4.30	25.2	414	2.93	147.28	3.27	42.8	492	3.43	179.69	3.18	71.5	506	3.44	198.31
40±5	2.70	31.9	545	4.49	190.32	3.09	55.7	632	4.60	230.25	3.33	80.5	631	4.91	242.41
20±2	2.70	16.5	342	1.65	118.88	3.83	26.2	352	1.83	127.92	3.35	27.8	378	2.18	136.41
30±2	1.77	15.6	398	2.77	135.22	1.98	23.4	429	2.23	148.85	2.05	22.8	436	3.28	151.06
40±2	2.93	33.2	545	5.20	191.40	3.33	51.8	617	4.88	223.73	3.29	42.8	638	6.03	225.71
05 AVG.	3.38	7.6	159	0.57	57.38	3.35	11.8	165	0.56	61.42	2.44	12.7	176	0.64	64.32
10 AVG.	3.27	30.5	250	1.23	97.35	3.34	38.7	257	1.18	103.66	3.19	48.1	275	1.21	113.74
15 AVG.	3.66	22.7	307	1.87	111.84	3.45	32.1	308	1.94	116.44	3.60	42.5	324	1.96	126.94
20 AVG.	3.65	43.4	394	3.83	149.61	4.03	70.1	412	2.75	168.86	4.35	88.3	418	2.69	180.10
9-FTP						2.84	32.5	346	2.17	128.04					
9-FTP						3.24	27.9	368	2.85	133.25					
9-WOT						8.27	369.2	720	0.85	418.48					
9-WOT						8.08	347.6	763	1.26	421.08					

*Fuel Consumption in Grams/Minute

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-4 (Cont'd.)

TABLE 04-3. TRUCK 004 SUMMARY - GRAMS/KILOGRAM OF FUEL
1975 IHC D2GAS 5.65 Litre V-8 GVW 10206 KG Project 11-4133

Test	EMPTY LOAD - 5261 KG				HALF LOAD - 7257 KG				FULL LOAD - 9071 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	109.53	[illegible]	2525	0.05	107.25	97.6	2644	0.13	103.13	107.5	2388	0.61
05 SS	81.02	48.3	2837	4.27	94.40	38.7	2809	5.91	8.11	121.4	2953	2.76
10 SS	6.96	81.7	3019	5.72	8.94	101.6	2981	6.04	3.23	104.6	2995	6.36
15 SS	8.26	95.1	2994	7.39	8.77	91.3	2998	8.52	6.20	99.1	2994	7.02
20 SS	6.17	77.4	3028	6.89	6.73	69.4	3039	8.02	5.06	82.3	3024	6.71
30 SS	10.53	118.5	2950	11.84	11.63	111.4	2958	13.03	10.54	91.6	2992	13.43
40 SS	13.96	137.0	2910	20.37	14.99	146.8	2891	25.03	14.44	148.8	2890	27.83
55 SS	12.10	188.5	2835	26.82	11.64	166.6	2871	25.57	11.17	169.5	2868	23.29
20±5	26.47	223.5	2734	18.52	22.69	314.0	2604	15.54	19.30	398.5	2482	16.26
30±5	29.22	170.9	2808	19.90	18.19	238.2	2737	19.07	16.04	360.7	2552	17.34
40±5	14.20	167.6	2861	23.59	13.40	242.1	2747	20.00	13.75	331.9	2604	20.26
20±2	22.75	138.4	2880	13.88	29.91	204.7	2753	14.33	24.59	204.1	2771	15.98
30±2	13.07	115.3	2947	20.52	13.32	156.9	2881	14.97	13.56	150.9	2889	21.71
40±2	15.29	173.3	2849	27.16	14.89	231.6	2758	21.80	14.57	189.7	2825	26.70
05 AVG.	58.89	133.0	2774	9.94	54.58	192.3	2694	9.10	37.98	197.2	2739	10.01
10 AVG.	33.56	313.7	2570	12.62	32.23	373.0	2481	11.40	28.01	423.2	2416	10.61
15 AVG.	32.71	202.6	2747	16.76	29.65	275.7	2642	16.64	28.38	335.0	2553	15.47
20 AVG.	24.36	290.3	2636	25.61	23.84	415.2	2441	16.29	24.14	490.3	2323	14.92
9-FTP					22.19	253.4	2701	16.98				
9-FTP					24.33	209.5	2763	21.37				
9-WOT					19.76	882.3	1720	2.02				
9-WOT					19.19	825.4	1812	2.99				

APPENDIX C-4 (Cont'd.)

TABLE 04-4. TRUCK 004 SUMMARY - OPERATING DATA
1975 IHC D2GAS 5.65 Litre V08 GVW 10206 KG Project 11-4133

	EMPTY LOAD - 5261 KG			HALF LOAD - 7275 KG			FULL LOAD - 9071 KG		
Test Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	625	18.0	41	625	18.0	11	625	18.0
05 SS	72	1700	20.0	42	1725	20.0	12	1760	20.0
10 SS	73	1850	20.4	43	1800	20.6	13	1880	20.5
15 SS	74	1700	19.2	44	1675	19.5	14	1650	19.5
20 SS	75	2225	19.0	45	2225	18.5	15	2300	18.0
30 SS	76	2000	15.5	46	2025	15.0	16	2000	15.0
40 SS	77	2150	12.7	47	2175	12.0	17	2175	11.0
55 SS	78	2950	8.5	48	2925	7.0	18	3000	5.5
		Period			Period			Period	
20±5	81	16.0		51	16.0		21	16.0	
30±5	82	34.0		52	34.0		22	34.0	
40±5	83	60.0		53	60.0		23	60.0	
20±2	84	16.0		54	16.0		24	16.0	
30±2	85	34.0		55	34.0		25	34.0	
40±2	86	60.0		56	60.0		26	60.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX C-5

TABLE 05-1. TRUCK 005 SUMMARY - GRAMS/KILOMETRE

1965 Chevrolet D2GAS 4.79 Litre I-6 GVW 8845 KG Project 11-4133

Test	EMPTY LOAD - 5080 KG					HALF LOAD - 7257 KG					FULL LOAD - 9071 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	16.97	123.8	2044	4.47	96.85	19.30	117.8	1995	4.17	94.73	26.78	98.6	1796	2.72	86.05
10 SS	8.71	59.0	1049	2.86	49.43	7.70	53.1	1015	2.51	47.46	8.04	55.2	1097	2.64	51.08
15 SS	9.80	32.9	564	1.99	27.32	10.65	36.6	527	1.65	26.12	10.94	24.2	627	2.23	29.57
20 SS	4.31	24.0	579	2.91	26.63	3.85	27.3	565	2.61	26.19	3.23	21.1	564	3.28	25.66
30 SS	2.03	14.5	468	5.18	21.00	1.84	14.6	470	4.59	21.09	1.25	12.5	493	4.59	21.83
40 SS	1.00	23.5	537	7.43	24.39	1.11	26.0	553	8.14	25.25	0.89	18.1	614	6.79	27.26
55 SS	10.01	28.1	722	1.00	33.73	3.19	234.6	603	2.55	41.48	4.32	255.0	638	4.65	44.48
20±5	4.89	35.8	653	4.91	30.63	6.59	73.0	679	4.86	34.44	6.53	145.5	688	3.33	39.61
30±5	3.49	28.0	517	4.02	24.16	3.58	63.5	505	3.45	26.03	3.95	114.2	539	2.67	30.89
40±5	1.31	28.9	548	5.57	25.24	2.05	89.0	585	4.50	30.91	2.62	145.7	681	4.66	38.80
20±2	4.60	33.6	608	3.10	28.56	4.62	39.9	626	2.91	29.71	5.28	38.5	693	4.65	32.54
30±2	2.70	13.9	430	3.58	19.46	2.60	24.3	497	4.04	22.98	2.85	25.7	546	5.16	25.18
40±2	1.08	25.5	569	6.03	25.87	1.22	35.1	604	6.55	28.04	1.47	60.1	691	7.25	33.40
05 AVG.	21.31	104.9	1035	6.18	53.54	21.31	106.0	1039	4.18	53.80	20.59	127.4	1030	3.52	54.73
10 AVG.	13.33	140.1	886	2.99	48.53	15.01	197.2	895	3.10	52.93	15.72	219.1	933	3.48	56.08
15 AVG.	6.57	103.0	738	4.30	38.90	6.79	77.5	710	4.55	36.07	8.10	169.1	840	4.23	47.82
20 AVG.	6.49	131.5	698	4.38	39.12	6.98	183.3	715	3.67	43.34	8.16	225.2	793	3.79	49.58

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX C-5 (Cont'd.)

TABLE 05-2. TRUCK 005 SUMMARY - GRAMS/MINUTE

1965 Chevrolet D2GAS 4.79 Litre I-6 GVW 8845 KG Project 11-4133

Test	EMPTY LOAD - 5080 KG					HALF LOAD - 7257 KG					FULL LOAD - 9071 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	2.19	2.3	56	0.02	21.10	2.47	4.1	41	0.02	17.61	1.95	4.7	53	0.02	20.97
05 SS	2.32	16.9	279	0.61	98.73	2.64	16.1	272	0.57	96.57	3.66	13.5	246	0.37	87.86
10 SS	2.30	15.6	277	0.76	97.41	2.04	14.1	269	0.67	94.00	2.13	14.6	291	0.70	101.17
15 SS	3.93	13.2	226	0.80	81.70	4.30	14.8	213	0.67	78.72	4.40	9.8	252	0.90	88.80
20 SS	2.32	12.9	311	1.57	106.99	2.08	14.7	305	1.41	105.56	1.74	11.3	304	1.76	103.17
30 SS	1.63	11.7	377	4.17	126.43	1.47	11.7	377	3.68	126.15	1.00	10.0	396	3.68	130.92
40 SS	1.08	25.2	578	7.99	195.99	1.19	27.8	590	8.69	201.17	0.95	19.5	660	7.30	218.71
55 SS	14.77	41.5	1066	1.48	371.73	4.68	344.6	885	3.74	454.85	6.37	375.7	940	6.85	489.35
20±5	2.62	19.2	350	2.63	122.65	3.56	39.4	367	2.63	138.87	3.50	78.1	369	1.79	158.71
30±5	2.82	22.6	418	3.25	145.92	2.89	51.3	408	2.79	157.13	3.19	92.3	436	2.16	186.44
40±5	1.39	30.7	583	5.93	200.41	2.20	95.6	628	4.83	247.78	2.82	156.5	732	5.01	311.24
20±2	2.51	18.4	332	1.69	116.51	2.49	21.5	338	1.57	119.80	2.85	20.8	374	2.51	131.02
30±2	2.17	11.2	346	2.88	116.99	2.10	19.6	401	3.26	138.23	2.30	20.7	440	4.15	151.36
40±2	1.16	27.4	612	6.49	207.93	1.31	37.5	646	7.01	223.83	1.57	64.4	740	7.76	266.95
05 AVG.	3.00	14.8	146	0.87	56.25	3.11	15.5	152	0.61	58.64	2.91	18.0	145	0.50	57.71
10 AVG.	3.62	38.0	241	0.81	98.35	4.20	55.2	250	0.87	110.56	4.33	60.4	257	0.96	115.43
15 AVG.	2.72	42.7	306	1.78	120.34	2.82	32.3	295	1.89	112.02	3.36	70.2	349	1.76	148.13
20 AVG.	3.63	73.5	390	2.45	163.19	3.90	102.5	400	2.05	180.85	4.51	124.3	438	2.09	204.35
9-FTP						2.84	36.8	308	1.85	118.22					
9-FTP						2.74	36.4	308	1.95	117.83					
9-WOT						3.84	220.0	759	5.60	352.32					
9-WOT						3.85	217.0	744	5.80	346.19					

*Fuel Consumption in Grams/Minute

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-5 (Cont'd.)

TABLE 05-3. TRUCK 005 SUMMARY - GRAMS/KILOGRAM OF FUEL

1965 Chevrolet D2GAS 4.79 Litre I-6 GVW 8845 KG Project 11-4133

Test	EMPTY LOAD - 5080 KG				HALF LOAD - 7257 KG				FULL LOAD - 9071 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	104.02	107.1	2671	0.83	100.35	234.8	2356	1.38	92.93	226.0	2520	0.93
05 SS	23.47	171.2	2826	6.19	27.28	166.6	2821	5.89	41.69	153.5	2796	4.23
10 SS	23.61	159.8	2843	7.76	21.73	149.7	2865	7.09	21.07	144.7	2875	6.92
15 SS	48.04	161.2	2764	9.74	54.60	187.4	2702	8.48	49.57	109.8	2840	10.11
20 SS	21.66	120.9	2911	14.63	19.67	139.5	2888	13.34	16.88	110.0	2943	17.10
30 SS	12.93	92.3	2983	33.02	11.69	92.7	2987	29.17	7.66	76.6	3025	28.13
40 SS	5.51	128.8	2950	40.78	5.90	138.1	2934	43.20	4.37	88.9	3016	33.36
55 SS	39.73	111.7	2868	3.97	10.29	757.5	1947	8.23	13.02	767.8	1922	14.01
20±5	21.38	156.5	2856	21.47	25.65	283.9	2642	18.91	22.08	492.1	2326	11.26
30±5	19.32	155.2	2864	22.30	18.40	326.4	2598	17.77	17.13	495.3	2337	11.58
40±5	6.94	153.1	2907	29.58	8.89	385.7	2535	19.50	9.04	502.8	2351	16.10
20±2	21.56	157.7	2853	14.53	20.81	179.9	2821	13.12	21.72	158.4	2852	19.16
30±2	18.57	95.4	2961	24.65	15.17	141.8	2898	23.57	15.18	136.9	2906	27.44
40±2	5.57	132.0	2944	31.22	5.83	167.6	2888	31.31	5.90	241.1	2772	29.09
05 AVG.	53.30	262.4	2588	15.47	53.05	263.8	2587	10.41	50.38	311.7	2520	8.61
10 AVG.	36.78	386.6	2445	8.25	37.99	498.9	2265	7.84	37.55	523.3	2228	8.31
15 AVG.	22.63	354.7	2540	14.81	25.21	287.9	2637	16.90	22.68	473.6	2353	11.85
20 AVG.	22.22	450.3	2391	15.01	21.58	566.6	2211	11.35	22.05	608.5	2143	10.23
9-FTP					24.00	311.3	2604	15.63				
9-FTP					23.24	308.7	2611	16.55				
9-WOT					10.90	624.5	2154	15.90				
9-WOT					11.11	626.8	2149	16.76				

APPENDIX C-5 (Cont'd.)

TABLE 05-4. TRUCK 005 SUMMARY - OPERATING DATA

1965 Chevrolet D2GAS 4.79 Litre I-6 GVW 8845 KG Project 11-4133

Test Desc.	EMPTY LOAD - 5080 KG Test No.	RPM	Man. Vac.	HALF LOAD - 7257 KG Test No.	RPM	Man. Vac.	FULL LOAD - 9071 KG Test No.	RPM	Man. Vac.
00 SS	71	560	16.0	41	575	17.3	11	570	16.2
05 SS	72	2520	20.2	42	2400	20.0	12	2460	20.0
10 SS	73	2440	19.6	43	2400	19.4	13	2400	19.5
15 SS	74	1720	17.8	44	1760	18.6	14	1800	17.3
20 SS	75	2250	17.5	45	2200	17.8	15	2250	17.4
30 SS	76	1950	13.8	46	1920	13.6	16	2000	13.0
40 SS	77	2525	12.2	47	2525	11.5	17	2575	10.0
55 SS	78	3425	8.1	48	3400	7.0	18	3400	3.0
		Period			Period			Period	
20±5	81	28.0		51	28.0		21	28.0	
30±5	82	62.0		52	62.0		22	62.0	
40±5	83	94.0		53	94.0		23	94.0	
20±2	84	28.0		54	28.0		24	28.0	
30±2	85	62.0		55	62.0		25	62.0	
40±2	86	94.0		56	94.0		26	94.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX C-6

TABLE 06-1. TRUCK 006 SUMMARY - GRAMS/KILOMETRE
1974 Ford D2GAS 6.41 Litre V-8 GVW 10505 KG Project 11-4133

Test Desc.	EMPTY LOAD - 5216 KG					HALF LOAD - 7257 KG					FULL LOAD - 9071 KG				
	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	65.94	23.9	2342	4.67	109.4	5.64	57.1	2691	6.01	118.3	5.33	42.8	2383	4.43	104.3
10 SS	2.52	36.3	1446	4.52	63.9	2.71	38.0	1546	4.56	68.2	3.78	54.6	1490	4.41	67.1
15 SS	1.46	15.4	835	2.75	36.5	1.65	16.5	894	2.91	39.1	1.99	25.3	849	2.68	37.8
20 SS	1.80	28.9	862	4.57	38.6	2.14	33.0	930	4.81	41.8	2.92	46.8	901	4.98	41.6
30 SS	2.16	27.8	671	4.79	30.5	2.60	36.4	726	5.27	33.5	3.16	47.4	731	5.61	34.5
40 SS	2.47	28.2	579	6.69	26.7	2.77	30.5	654	7.34	30.0	3.27	38.7	656	7.98	30.7
55 SS	1.83	14.2	756	11.60	33.1	1.73	13.8	862	13.85	37.6	3.61	68.1	874	13.66	41.9
20±5	13.12	61.1	963	7.90	46.5	13.96	79.2	1015	9.76	50.0	16.75	149.1	1117	9.50	59.4
30±5	5.97	31.7	713	6.35	33.1	9.93	43.9	757	8.11	36.2	9.49	69.1	773	7.55	38.5
40±5	2.54	23.7	615	6.70	27.9	3.17	40.8	671	7.74	31.5	5.12	62.2	672	6.38	33.2
20±2	4.16	52.3	888	4.44	41.5	7.47	56.9	872	5.52	41.6	7.85	62.5	924	6.70	44.3
30±2	2.55	34.4	678	4.60	31.3	2.98	40.7	716	5.68	33.4	2.75	32.0	753	6.05	34.3
40±2	2.48	26.3	587	6.30	26.9	2.69	26.3	696	8.13	31.5	2.54	22.7	684	8.13	30.7
05 AVG.	54.91	74.5	1529	5.90	76.9	41.75	81.6	1539	6.43	76.1	54.59	109.8	1516	5.33	78.7
10 AVG.	29.07	108.2	1215	6.28	62.4	25.94	110.9	1202	7.32	61.6	35.33	175.7	1275	6.82	70.3
15 AVG.	14.55	54.6	901	7.14	43.6	14.64	68.4	934	6.95	46.0	18.12	97.8	979	6.92	50.3
20 AVG.	11.55	66.6	866	7.41	42.6	10.82	86.2	891	7.37	44.8	14.70	141.3	921	6.47	50.3

*Fuel Consumption in Litre/100km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX C-6 (Cont'd.)

TABLE 06-2. TRUCK 006 SUMMARY - GRAMS/MINUTE

1974 Ford D2GAS 6.41 Litre V-8 GVW 10505 KG Project 11-4133

Test	EMPTY LOAD - 5216 KG					HALF LOAD - 7257 KG					FULL LOAD - 9071 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	8.12	3.3	110	0.01	44.5	8.14	4.4	116	0.01	46.9	12.51	1.6	86	0.01	40.4
05 SS	9.06	3.3	322	0.64	112.3	0.77	7.8	367	0.82	120.3	0.73	5.9	326	0.61	106.5
10 SS	0.67	9.7	384	1.20	126.7	0.72	10.1	411	1.21	135.5	1.00	14.5	395	1.17	132.9
15 SS	0.59	6.2	335	1.10	109.2	0.66	6.6	360	1.17	117.7	0.80	10.2	342	1.08	113.7
20 SS	0.96	15.4	460	2.44	153.9	1.15	17.7	500	2.58	167.6	1.57	25.2	485	2.68	167.2
30 SS	1.74	22.5	542	3.87	184.0	2.09	29.3	585	4.24	201.2	2.55	38.2	590	4.53	207.6
40 SS	2.64	30.2	620	7.16	213.1	2.97	32.7	703	7.88	240.9	3.50	41.4	702	8.54	245.5
55 SS	2.70	20.9	1113	17.07	364.2	2.55	20.4	1271	20.43	413.6	5.33	100.4	1289	20.15	461.7
20±5	7.14	33.3	524	4.30	189.1	7.47	42.4	543	5.22	199.8	8.96	79.8	598	5.09	237.1
30±5	4.88	25.9	583	5.19	201.6	7.98	35.2	608	6.51	217.4	7.67	55.8	625	6.10	232.4
40±5	2.73	25.5	663	7.22	224.5	3.40	43.7	719	8.29	251.8	5.49	66.8	722	6.85	266.3
20±2	2.23	28.1	477	2.39	166.6	4.00	30.5	467	2.96	166.5	4.22	33.5	496	3.60	177.4
30±2	2.06	27.8	548	3.72	188.9	2.41	32.8	577	4.58	200.9	2.22	25.8	607	4.88	206.5
40±2	2.66	28.2	629	6.75	215.0	2.88	28.1	745	8.71	252.0	2.73	24.3	734	8.72	246.3
05 AVG.	7.65	10.4	213	0.82	80.0	5.77	11.3	213	0.89	78.5	7.65	15.4	212	0.75	82.3
10 AVG.	7.93	29.5	331	1.71	127.1	7.11	30.4	329	2.01	126.1	9.70	48.3	350	1.87	144.2
15 AVG.	5.91	22.2	366	2.90	132.3	5.97	27.9	381	2.83	140.0	7.42	40.1	401	2.83	153.8
20 AVG.	6.47	37.3	485	4.15	178.1	6.05	48.2	498	4.12	187.1	8.23	79.1	515	3.62	210.1
9-FTP						5.14	26.1	418	3.93	150.1					
9-FTP						5.51	26.4	432	4.03	155.0					
9-WOT						8.74	279.2	941	5.95	444.2					
9-WOT						8.96	278.7	953	6.54	447.7					

*Fuel Consumption in Grams/Minute

9-FTP - Nine-Mode Federal Test Procedure
9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-6 (Cont'd.)

TABLE 06-3. TRUCK 006 SUMMARY - GRAMS/KILOGRAM OF FUEL

1974 Ford D2GAS 6.41 Litre V-8 GVW 10505 KG Project 11-4133

Test	EMPTY LOAD - 5216 KG				HALF LOAD - 7257 KG				FULL LOAD - 9071 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	102.50	73.6	2475	0.13	103.52	93.9	2472	0.14	109.43	40.2	2126	0.18
05 SS	80.72	29.3	2867	5.72	6.39	64.7	3047	6.80	6.85	55.0	3061	5.69
10 SS	5.29	76.2	3033	9.48	5.33	74.7	3035	8.96	7.54	109.0	2974	8.80
15 SS	5.36	56.3	3064	10.07	5.64	56.5	3063	9.98	7.04	89.7	3006	9.50
20 SS	6.23	100.2	2992	15.85	6.85	105.8	2981	15.42	9.42	150.9	2902	16.03
30 SS	9.47	122.3	2947	21.03	10.40	145.6	2908	21.10	12.29	184.2	2841	21.80
40 SS	12.39	141.6	2908	33.60	12.34	135.8	2917	32.72	14.25	168.5	2859	34.81
55 SS	7.42	57.3	3056	46.88	6.16	49.3	3072	49.39	11.53	217.5	2791	43.64
20±5	37.77	175.9	2773	22.76	37.37	212.1	2718	26.15	37.80	336.4	2521	21.44
30±5	24.21	128.5	2891	25.74	36.72	162.2	2798	29.97	32.99	240.2	2687	26.24
40±5	12.18	113.7	2952	32.17	13.48	173.5	2854	32.93	20.63	250.8	2710	25.73
20±2	13.41	168.7	2862	14.32	24.01	182.9	2806	17.76	23.77	189.1	2797	20.29
30±2	10.92	147.3	2903	19.70	11.98	163.3	2875	22.82	10.75	124.9	2939	23.61
40±2	12.36	131.0	2924	31.41	11.45	111.6	2958	34.55	11.08	98.8	2979	35.41
05 AVG.	95.63	129.7	2662	10.28	73.51	143.7	2711	11.32	92.92	187.0	2581	9.07
10 AVG.	62.37	232.2	2607	13.47	56.36	241.0	2612	15.91	67.32	334.7	2430	13.00
15 AVG.	44.66	167.5	2765	21.91	42.64	199.2	2721	20.24	48.25	260.6	2607	18.43
20 AVG.	36.33	209.4	2725	23.31	32.33	257.5	2662	22.04	39.17	376.5	2454	17.24
9-FTP					34.22	173.8	2788	26.22				
9-FTP					35.55	170.6	2789	26.00				
9-WOT					19.67	628.6	2119	13.40				
9-WOT					20.01	622.5	2128	14.62				

APPENDIX C-6 (Cont'd.)

TABLE 06-4. TRUCK 006 SUMMARY - OPERATING DATA

1974 Ford D2GAS 6.41 Litre V-8 GVW 10505 KG Project 11-4133

	EMPTY LOAD - 5216 KG			HALF LOAD - 7257 KG			FULL LOAD - 9071 KG		
Test Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	800	16.0	41	800	16.0	11	800	16.5
05 SS	72	2025	19.8	42	2050	19.6	12	2025	19.8
10 SS	73	2175	19.2	43	2200	19.2	13	2200	19.3
15 SS	74	1800	19.5	44	1825	18.7	14	1775	18.8
20 SS	75	2425	18.3	45	2450	17.8	15	2425	18.1
30 SS	76	2450	16.2	46	2450	16.0	16	2425	15.5
40 SS	77	2200	13.3	47	2200	12.5	17	2175	11.5
55 SS	78	3000	8.8	48	3000	7.0	18	3000	5.5
		Period			Period			Period	
20±5	81	16.0		51	16.0		21	16.0	
30±5	82	28.0		52	28.0		22	28.0	
40±5	83	56.0		53	56.0		23	56.0	
20±2	84	16.0		54	16.0		24	16.0	
30±2	85	28.0		55	28.0		25	28.0	
40±2	86	56.0		56	56.0		26	56.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX C-7

TABLE 07-1. TRUCK 007 SUMMARY - GRAMS/KILOMETRE

1974 IHC D2GAS 6.42 Litre V-8 GVW 10732 KG Project 11-4133

Test	EMPTY LOAD - 5261 KG					HALF LOAD - 7257 KG					FULL LOAD - 9071 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	6.76	163.6	3040	3.75	140.2	6.25	169.8	3202	4.10	147.4	5.97	176.1	3227	4.08	148.8
10 SS	2.75	66.6	1797	2.78	80.7	3.35	80.6	1776	2.57	80.8	3.05	87.2	1758	2.61	80.4
15 SS	2.46	48.4	1126	1.88	51.1	2.70	58.4	1149	1.95	52.7	2.48	60.8	1123	1.92	51.8
20 SS	1.98	45.0	1176	2.85	52.9	2.41	60.5	1208	2.86	55.3	2.04	59.5	1214	2.98	55.5
30 SS	1.85	34.1	827	3.23	37.4	2.19	42.6	854	3.45	39.2	1.88	37.5	878	3.84	39.8
40 SS	1.50	21.6	701	4.26	31.2	1.54	24.1	763	5.25	34.0	1.53	22.4	800	5.92	35.5
55 SS	--	--	--	--	--	4.14	122.5	914	6.59	47.3	5.09	154.0	948	6.68	50.9
20±5	16.32	91.9	1193	6.52	58.7	18.33	150.9	1108	6.75	59.2	20.66	186.7	1199	6.39	65.8
30±5	3.66	50.1	848	4.65	39.6	9.44	84.8	819	4.99	41.4	10.75	106.2	820	4.89	43.1
40±5	1.85	23.1	738	4.65	32.9	3.12	72.7	750	4.97	36.9	3.59	88.6	766	4.75	38.7
20±2	3.33	78.6	1187	3.40	55.8	4.47	115.7	1047	3.72	52.5	4.80	107.5	1054	4.31	52.3
30±2	2.44	43.4	811	3.12	37.4	2.96	70.8	775	3.62	37.8	2.71	55.2	797	3.75	37.6
40±2	2.05	30.3	718	4.18	32.6	2.32	42.7	726	5.44	33.8	2.50	40.0	754	5.67	34.8
05 AVG.	13.63	281.3	1642	3.03	89.9	14.63	336.9	1603	3.40	92.0	14.11	262.5	1704	3.50	91.3
10 AVG.	13.67	212.4	1264	4.31	69.3	14.44	242.8	1324	5.49	74.0	17.66	263.2	1413	6.00	79.5
15 AVG.	6.92	112.0	997	4.67	50.4	8.32	147.3	1051	5.27	55.3	9.05	138.6	1072	5.52	55.7
20 AVG.	5.97	102.0	964	4.83	48.3	8.06	153.3	1011	5.55	53.9	9.81	166.6	1047	5.39	56.6

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

-- Questionable Data Omitted

APPENDIX C-7 (Cont'd.)

TABLE 07-2. TRUCK 007 SUMMARY - GRAMS/MINUTE

1974 IHC D2GAS 6.42 Litre V-8 GVW 10732 KG Project 11-4133

Test	EMPTY LOAD - 5261 KG					HALF LOAD - 7257 KG					FULL LOAD - 9071 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	1.42	40.5	93	0.01	50.8	1.34	41.4	95	0.02	52.0	1.32	41.3	92	0.03	50.8
05 SS	0.91	22.1	411	0.51	141.5	0.86	23.3	439	0.56	151.0	0.82	24.1	441	0.56	151.9
10 SS	0.73	17.6	476	0.74	159.5	0.88	21.2	467	0.68	158.7	0.81	23.3	469	0.70	160.4
15 SS	0.99	19.5	453	0.76	153.6	1.08	23.5	462	0.78	158.4	0.99	24.4	451	0.77	155.3
20 SS	1.06	24.3	634	1.54	213.0	1.30	32.6	650	1.54	222.6	1.10	32.1	655	1.61	223.6
30 SS	1.49	27.5	666	2.60	225.2	1.75	34.1	684	2.76	234.5	1.51	30.5	707	3.10	239.5
40 SS	1.62	23.2	755	4.59	251.4	1.65	25.7	815	5.60	271.5	1.63	24.0	855	6.32	283.2
55 SS	--	--	--	--	--	6.14	181.7	1355	9.78	523.8	7.47	226.4	1394	9.82	559.4
20±5	8.87	49.9	648	3.54	238.1	10.14	83.5	613	3.73	244.8	11.17	100.9	648	3.45	265.6
30±5	2.96	40.5	686	3.76	239.4	7.67	68.9	665	4.06	251.7	8.62	85.1	658	3.92	258.3
40±5	1.99	24.9	794	5.00	264.8	3.35	78.2	807	5.34	296.6	3.77	92.9	804	4.98	303.5
20±2	1.77	41.9	632	1.81	221.9	2.46	63.6	576	2.05	215.6	2.65	59.3	581	2.38	215.4
30±2	1.97	35.1	656	2.52	226.2	2.42	57.8	632	2.95	230.5	2.18	44.4	641	3.02	226.3
40±2	2.19	32.4	766	4.47	259.8	2.52	46.4	789	5.92	274.5	2.68	42.8	808	6.07	278.7
05 AVG.	1.95	40.3	235	0.43	96.2	2.11	48.6	231	0.49	99.2	2.06	38.3	249	0.51	99.5
10 AVG.	3.80	59.0	351	1.20	143.9	3.98	67.0	365	1.51	152.4	4.83	72.1	387	1.64	162.5
15 AVG.	2.82	45.7	407	1.90	153.7	3.40	60.3	430	2.16	168.9	3.69	56.5	437	2.25	169.4
20 AVG.	3.31	56.6	535	2.68	200.2	4.52	85.9	567	3.11	225.9	5.54	94.0	591	3.04	238.4
9-FTP						4.68	41.3	452	2.29	167.7					
9-FTP						4.81	48.8	424	2.03	162.7					
9-WOT						6.98	225.1	961	7.81	436.8					
9-WOT						7.91	254.0	917	7.05	423.0					

*Fuel Consumption in Grams/Minute

9-FTP - Nine-Mode Federal Test Procedure
9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-7 (Cont'd.)

TABLE 07-3. TRUCK 007 SUMMARY - GRAMS/KILOGRAM OF FUEL

1974 IHC D2GAS 6.42 Litre V-8 GVW 10732 KG Project 11-4133

Test Desc.	EMPTY LOAD - 5261 KG				HALF LOAD - 7257 KG				FULL LOAD - 9071 KG			
	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	27.98	797.3	1828	0.11	25.73	796.9	1836	0.40	26.04	811.4	1812	0.66
05 SS	6.46	156.2	2903	3.58	5.67	154.2	2909	3.72	5.37	158.4	2903	3.67
10 SS	4.57	110.5	2981	4.61	5.55	133.5	2942	4.26	5.08	145.2	2925	4.34
15 SS	6.46	126.8	2950	4.92	6.85	148.3	2915	4.95	6.40	157.1	2902	4.96
20 SS	4.99	113.9	2975	7.21	5.84	146.2	2921	6.92	4.93	143.6	2928	7.19
30 SS	6.62	121.9	2957	11.54	7.47	145.5	2917	11.78	6.31	127.1	2950	12.92
40 SS	6.43	92.4	3004	18.24	6.07	94.7	3001	20.63	5.75	84.6	3018	22.32
55 SS					11.73	347.0	2587	18.66	13.36	404.7	2491	17.55
20±5	37.24	209.7	2722	14.87	41.41	340.8	2503	15.24	42.04	379.9	2439	12.99
30±5	12.37	169.2	2864	15.70	30.47	273.7	2643	16.11	33.37	329.5	2546	15.18
40±5	7.51	93.9	2998	18.88	11.30	263.5	2720	18.01	12.41	306.2	2649	16.41
20±2	8.00	188.7	2848	8.15	11.40	295.0	2670	9.49	12.28	275.2	2698	11.03
30±2	8.73	155.0	2898	11.14	10.48	250.7	2742	12.80	9.64	196.1	2831	13.33
40±2	8.44	124.6	2947	17.18	9.18	169.1	2875	21.55	9.61	153.6	2898	21.78
05 AVG.	20.31	419.1	2446	4.52	21.28	490.0	2332	4.95	20.70	384.9	2499	5.14
10 AVG.	26.40	410.2	2441	8.32	26.14	439.5	2396	9.93	29.73	443.3	2379	10.10
15 AVG.	18.37	297.2	2644	12.38	20.15	356.8	2545	12.77	21.76	333.2	2577	13.27
20 AVG.	16,53	282.8	2673	13.38	20.02	380.4	2508	13.78	23.22	394.1	2477	12.75
9-FTP					27.92	246.1	2694	13.67				
9-FTP					29.53	299.7	2605	12.45				
9-WOT					15.99	584.0	2201	17.88				
9-WOT					18.69	600.5	2167	16.67				

APPENDIX C-7 (Cont'd.)

TABLE 07-4. TRUCK 007 SUMMARY - OPERATING DATA

1974 IHC D2GAS 6.42 Litre V-8 GVW 10732 KG Project 11-4133

	EMPTY LOAD-5261 KG			HALF LOAD - 7257 KG			FULL LOAD - 9071 KG		
Test Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	780	18.0	41	760	18.0	11	740	17.6
05 SS	72	2240	19.0	42	2320	18.6	12	2320	18.4
10 SS	73	2360	18.0	43	2320	18.1	13	2360	18.0
15 SS	74	2120	17.3	44	2160	17.2	14	2120	17.2
20 SS	75	2800	17.0	45	2840	16.8	15	2840	16.5
30 SS	76	2560	15.0	46	2560	14.5	16	2560	14.2
40 SS	77	2400	11.5	47	2400	10.5	17	2400	9.8
55 SS	78	3240	7.5	48	3240	6.8	18	3260	6.3
		Period			Period			Period	
20±5	81	16.0		51	16.0		21	16.0	
30±5	82	30.0		52	30.0		22	30.0	
40±5	83	60.0		53	60.0		23	60.0	
20±2	84	16.0		54	16.0		24	16.0	
30±2	85	30.0		55	30.0		25	30.0	
40±2	86	60.0		56	60.0		26	60.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX C-8

TABLE 08-1. TRUCK 008 SUMMARY - GRAMS/KILOMETRE

1967 Dodge D2GAS 5.92 Litre V-8 GVW 10433 KG Project 11-4133

Test	EMPTY LOAD - 5216 KG					HALF LOAD - 7257 KG					FULL LOAD - 9071 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	15.29	368.5	1840	1.65	104.25	12.88	371.2	1844	1.76	104.30	14.94	347.6	1949	2.00	107.45
10 SS	7.27	178.9	949	0.94	52.98	7.06	180.3	977	1.03	54.19	7.54	177.9	997	1.11	54.97
15 SS	4.64	110.5	546	0.49	31.02	4.49	109.4	546	0.59	30.94	4.55	106.0	569	0.70	31.70
20 SS	4.08	95.7	575	1.39	31.21	3.81	97.4	595	1.63	32.14	3.92	99.9	602	1.60	32.61
30 SS	2.83	66.7	465	3.17	24.47	2.87	64.2	500	4.00	25.77	2.74	57.7	497	4.28	25.22
40 SS	2.35	31.0	584	7.98	27.06	2.21	20.3	632	9.37	28.36	2.27	18.4	654	9.32	29.16
55 SS	1.87	15.2	777	13.99	34.10	2.63	27.5	857	13.39	38.41	3.27	46.9	869	11.06	40.28
20±5	29.90	67.0	661	8.21	36.40	35.59	137.9	726	5.43	44.61	48.29	171.6	751	4.21	49.61
30±5	9.00	54.9	455	5.43	24.07	16.22	66.0	494	4.52	27.41	22.15	132.2	501	2.55	32.90
40±2	2.48	35.4	560	7.54	26.33	2.50	30.9	629	10.32	28.97	2.85	40.0	674	9.98	31.51
05 AVG.	62.01	330.3	1025	2.47	73.54	62.21	351.6	1062	2.56	76.55	62.01	384.9	1303	3.21	88.92
10 AVG.	43.55	213.0	837	3.13	55.35	45.83	264.8	883	3.01	61.03	60.65	325.8	1084	4.97	75.56
15 AVG.	22.12	127.9	732	5.59	42.39	24.26	151.1	797	6.66	46.96	28.15	226.6	1014	7.60	61.65
20 AVG.	18.14	123.7	721	6.09	41.13	20.78	160.1	787	6.22	46.68	26.56	281.1	954	5.46	62.54

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed

XX ±Y - Sinusoidal with designated average speed and amplitude

XX AVG. - Driving Cycle with designated average speed

APPENDIX C-8 (Cont'd.)

TABLE 08-2. TRUCK 008 SUMMARY - GRAMS/MINUTE

1967 Dodge D2GAS 5.92 Litre V-8 GVW 10433 KG Project 11-4133

Test	EMPTY LOAD - 5216 KG					HALF LOAD - 7257 KG					FULL LOAD - 9071 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	8.86	39.3	58	0.00	43.63	6.03	35.7	58	0.01	41.91	5.54	30.6	53	0.01	37.37
05 SS	2.09	50.4	252	0.23	106.45	1.76	50.8	252	0.24	106.50	2.04	47.5	266	0.27	109.53
10 SS	1.93	47.4	252	0.25	104.92	1.87	47.8	259	0.27	107.33	2.02	47.7	267	0.30	110.06
15 SS	1.87	44.4	219	0.20	93.07	1.81	44.0	220	0.24	92.92	1.82	42.5	228	0.28	94.89
20 SS	2.20	51.6	310	0.75	125.62	2.05	52.5	321	0.88	129.34	2.12	53.9	325	0.86	131.46
30 SS	2.29	53.9	376	2.56	147.60	2.31	51.7	402	3.22	154.80	2.22	46.8	403	3.47	152.63
40 SS	2.51	33.2	625	8.53	216.15	2.37	21.7	676	10.01	226.40	2.45	19.8	704	10.04	234.51
55 SS	2.75	22.3	1143	20.58	374.57	3.87	40.5	1261	19.70	421.82	4.84	69.3	1285	16.35	444.57
20±5	15.73	35.3	348	4.32	142.99	19.20	74.4	392	2.93	179.63	25.70	91.3	400	2.24	197.09
30±5	7.13	43.5	360	4.30	142.38	13.06	53.1	398	3.64	164.86	17.66	105.3	399	2.03	195.81
40±2	2.61	37.4	590	7.95	207.29	2.69	33.2	676	11.08	232.30	3.06	42.8	721	10.69	251.80
05 AVG.	8.66	46.1	143	0.35	76.67	8.85	50.0	15[illegible]	0.36	81.27	8.72	54.1	183	0.45	93.37
10 AVG.	11.91	58.3	229	0.85	113.02	12.84	74.2	247	0.84	127.67	16.84	90.5	301	1.38	156.63
15 AVG.	9.09	52.5	301	2.30	130.03	9.92	61.8	326	2.73	143.41	11.61	93.5	418	3.14	189.83
20 AVG.	10.13	69.1	403	3.40	171.49	11.82	91.1	448	3.54	198.27	14.89	157.6	535	3.06	261.80
9-FTP						6.93	62.9	327	2.41	141.38					
9-FTP						7.92	62.1	340	2.60	145.84					
9-WOT						8.26	398.9	798	1.53	457.94					
9-WOT						8.75	389.8	826	2.06	462.48					

*Fuel Consumption in Grams/Minute

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-8 (Cont'd.)

TABLE 08-3. TRUCK 008 SUMMARY - GRAMS/KILOGRAM OF FUEL

1967 Dodge D2GAS 5.92 Litre V-8 GVW 10433 KG Project 11-4133

Test	EMPTY LOAD - 5216 KG				HALF LOAD - 7257 KG				FULL LOAD - 9071 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	82.31	365.4	1334	0.01	103.94	851.5	1375	0.13	108.37	819.5	1411	0.22
05 SS	19.64	473.4	2363	2.12	16.54	476.7	2368	2.26	18.62	433.3	2430	2.50
10 SS	18.39	452.2	2401	2.36	17.45	445.6	2414	2.55	18.38	433.4	2430	2.69
15 SS	20.04	477.1	2356	2.13	19.43	473.5	2364	2.57	19.22	447.9	2405	2.94
20 SS	17.50	410.8	2469	5.97	15.88	405.9	2481	6.79	16.12	410.1	2474	6.57
30 SS	15.51	365.2	2546	17.35	14.91	333.9	2597	20.79	14.55	306.5	2642	22.73
40 SS	11.62	153.6	2891	39.49	10.46	95.9	2986	44.23	10.44	84.4	3004	42.80
55 SS	7.85	59.6	3052	54.96	9.17	96.0	2990	46.70	10.89	155.8	2890	36.77
20±5	0.02	246.7	2433	30.22	6.86	413.9	2180	16.30	0.38	463.3	2028	11.38
30±5	50.09	305.6	2530	30.22	79.24	322.3	2412	22.08	90.17	537.9	2038	10.38
40±2	12.61	180.2	2846	38.35	11.56	142.9	2908	47.72	12.14	170.2	2864	42.43
05 AVG.	2.93	601.5	1866	4.50	8.85	615.3	1858	4.47	93.41	579.7	1962	4.84
10 AVG.	5.39	515.5	2025	7.56	0.57	581.0	1938	6.61	7.50	577.6	1921	8.80
15 AVG.	69.88	404.0	2313	17.65	69.17	431.0	2273	19.01	61.15	492.3	2202	16.52
20 AVG.	59.06	402.8	2349	19.85	59.61	459.3	2259	17.84	56.89	602.0	2043	11.70
9-FTP					49.00	445.2	2315	17.06				
9-FTP					54.31	425.7	2328	17.85				
9-WOT					18.03	871.2	1743	3.34				
9-WOT					18.91	842.9	1785	4.46				

APPENDIX C-8 (Cont'd.)

TABLE 08-4. TRUCK 008 SUMMARY - OPERATING DATA

1967 Dodge D2GAS 5.92 Litre V-8 GVW 10433 KG Project 11-4133

	EMPTY LOAD - 5216 KG			HALF LOAD - 7257 KG			FULL LOAD - 9071 KG		
Test Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	560	14.4	41	620	15.0	11	620	14.8
05 SS	72	2100	20.0	42	2160	20.1	12	2200	20.0
10 SS	73	1960	19.8	43	2000	19.6	13	2040	19.8
15 SS	74	1520	19.4	44	1520	18.5	14	1540	19.1
20 SS	75	2000	18.6	45	2040	18.3	15	2040	18.1
30 SS	76	1840	15.3	46	1860	14.8	16	1840	14.6
40 SS	77	2440	14.0	47	2420	13.0	17	2440	12.2
55 SS	78	3300	9.9	48	3320	8.5	18	3320	7.5
		Period			Period			Period	
20±5	81	18.0		51	18.0		21	18.0	
30±5	82	38.0		52	38.0		22	38.0	
40±2	86	48.0		56	48.0		26	48.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX C-9

TABLE 09-1. TRUCK 009 SUMMARY - GRAMS/KILOMETRE

1971 IHC D3GAS 5.65 Litre V-8 GVW 18144 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	8.60	164.2	1403	2.01	71.33	9.91	201.0	1574	2.90	81.18	9.44	172.5	1544	2.53	77.96
10 SS	4.13	75.9	925	1.97	44.66	4.47	85.9	884	1.82	43.67	4.94	85.7	852	1.74	42.36
15 SS	3.27	59.0	590	1.44	29.28	3.22	57.7	594	1.66	29.38	3.68	60.8	574	1.69	28.80
20 SS	1.86	31.2	655	2.54	30.00	2.80	48.3	663	3.16	31.59	2.83	39.5	682	3.56	31.81
30 SS	2.63	33.2	500	5.08	23.69	2.79	37.5	548	6.61	26.00	2.96	30.5	576	6.86	26.76
40 SS	2.80	29.7	555	8.79	25.81	2.79	30.7	610	9.58	28.20	2.84	22.6	704	10.29	31.65
55 SS**	1.97	50.4	793	9.32	37.12	3.65	145.2	823	7.65	44.89	4.19	118.2	865	8.27	44.97
20±5	10.38	57.1	660	5.59	33.08	13.97	54.8	693	7.61	34.81	20.59	107.2	857	7.75	46.09
30±5	2.91	35.4	488	5.39	143.51	7.75	35.4	496	5.53	24.33	49.32	102.3	528	1.48	35.71
40±2	2.62	30.3	542	7.75	25.26	3.00	28.5	562	8.10	26.03	3.78	41.5	698	9.03	32.74
05 AVG.	18.29	273.3	1128	2.95	68.25	38.49	320.9	1191	5.28	76.80	51.32	316.2	1253	5.19	80.83
10 AVG.	13.89	144.5	926	4.57	50.59	15.15	197.5	939	5.46	54.84	19.67	236.2	1075	5.36	63.75
15 AVG.	10.45	122.4	826	6.01	44.44	14.35	179.7	917	6.50	52.63	39.05	223.5	1019	5.19	63.13
20 AVG.	8.05	122.8	820	6.29	43.87	15.28	171.9	857	6.79	49.68	36.54	202.5	966	6.35	59.18

*Fuel Consumption in Litre/100 km

**50 mph at Full Load

XX SS - Steady State at designated speed

XX ±Y - Sinusoidal with designated average speed and amplitude

XX AVG. - Driving Cycle with designated average speed

APPENDIX C-9 (Cont'd.)

TABLE 09-2. TRUCK 009 SUMMARY - GRAMS/MINUTE

1971 IHC D3GAS 5.65 Litre V-8 GVW 18144 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	1.14	35.2	82	0.03	44.37	1.46	42.0	79	0.04	47.30	1.27	37.6	82	0.03	45.74
05 SS	1.25	23.8	203	0.29	77.05	1.44	29.2	228	0.42	87.92	1.38	25.2	225	0.37	84.85
10 SS	1.13	20.8	253	0.54	91.20	1.22	23.5	242	0.50	89.10	1.37	23.7	236	0.48	87.45
15 SS	1.34	24.2	242	0.59	89.76	1.32	23.7	244	0.68	89.93	1.51	24.9	236	0.69	88.22
20 SS	1.00	16.8	353	1.37	120.74	1.51	26.1	357	1.70	127.12	1.52	21.3	367	1.92	128.00
30 SS	2.12	26.7	402	4.08	142.30	2.24	30.1	440	5.31	155.93	2.38	24.5	464	5.52	160.86
40 SS	2.99	31.7	593	9.38	205.69	2.99	32.8	653	10.25	225.32	3.03	24.1	753	11.00	252.61
55 SS**	2.90	74.0	1166	13.70	407.36	5.38	213.8	1211	11.26	493.42	5.59	157.9	1155	11.04	448.35
20±5	5.63	31.0	358	3.03	133.97	7.57	29.7	376	4.12	140.80	11.02	57.4	459	4.15	184.18
30±5	2.40	29.1	401	4.43	143.51	6.31	28.8	404	4.51	148.10	38.53	79.9	412	1.16	208.28
40±2	2.85	32.9	588	8.41	204.66	3.22	30.6	604	8.71	209.00	3.98	43.7	735	9.51	257.54
05 AVG.	2.44	36.5	151	0.39	68.09	5.11	42.6	158	0.70	76.08	6.58	40.5	161	0.67	77.38
10 AVG.	3.71	38.7	248	1.22	101.26	3.99	52.1	248	1.44	107.91	4.84	58.1	264	1.32	117.08
15 AVG.	4.11	48.2	325	2.37	130.61	5.44	68.1	348	2.47	148.97	13.75	78.7	359	1.83	165.90
20 AVG.	4.16	63.5	424	3.25	169.29	7.51	84.5	421	3.33	182.28	16.38	90.8	433	2.85	198.01
9-FTP						5.37	32.3	327	3.42	124.61					
9-FTP						4.03	27.4	324	3.37	119.97					
9-WOT						49.26	176.0	636	2.30	335.11					
9-WOT						49.72	163.0	648	2.35	335.06					

*Fuel Consumption in Grams/Minute

**50 mph at Full Load

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-9 (Cont'd.)

TABLE 09-3. TRUCK 009 SUMMARY - GRAMS/KILOGRAM OF FUEL
1971 IHC D3GAS 5.65 Litre V-8 GVW 18144 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG				HALF LOAD - 12473 KG				FULL LOAD - 18370 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	25.68	793.1	1842	0.65	30.96	888.5	1675	0.80	27.73	821.5	1791	0.72
05 SS	16.16	308.4	2634	3.78	16.35	331.6	2596	4.79	16.23	296.4	2652	4.35
10 SS	12.38	227.7	2772	5.89	13.71	263.6	2712	5.59	15.61	271.1	2694	5.49
15 SS	14.94	269.8	2698	6.57	14.68	263.2	2709	7.58	17.14	282.5	2671	7.86
20 SS	8.32	139.3	2924	11.33	11.87	205.0	2810	13.41	11.91	166.3	2870	14.99
30 SS	14.87	188.0	2827	28.70	14.39	192.9	2821	34.04	14.81	152.4	2883	34.31
40 SS	14.54	154.3	2881	45.60	13.27	145.6	2898	45.48	12.01	95.5	2981	43.56
55 SS*	7.12	181.7	2861	33.64	10.90	433.2	2454	22.83	12.47	352.1	2577	24.62
20±5	42.02	231.3	2673	22.62	53.75	210.9	2668	29.28	59.83	311.6	2490	22.53
30±5	16.71	202.8	2798	30.90	42.64	194.6	2728	30.43	204.99	383.8	1980	5.57
40±2	13.91	160.7	2873	41.10	15.41	146.4	2890	41.66	15.46	169.8	2854	36.92
05 AVG.	35.89	536.4	2213	5.79	67.13	559.6	2077	9.20	85.04	523.9	2077	8.60
10 AVG.	36.69	382.5	2452	12.10	37.01	482.4	2294	13.34	41.33	496.3	2259	11.27
15 AVG.	31.49	368.9	2490	18.11	36.52	457.4	2335	16.55	82.86	474.2	2162	11.01
20 AVG.	24.58	374.9	2502	19.22	41.21	463.5	2311	18.29	82.71	458.4	2187	14.37
9-FTP					43.13	258.8	2626	27.47				
9-FTP					33.55	228.7	2704	28.06				
9-WOT					7.00	513.2	1897	6.87				
9-WOT					8.38	486.6	1934	7.01				

*50 mph at Full Load

APPENDIX C-9 (Cont'd.)

TABLE 09-4. TRUCK 009 SUMMARY - OPERATING DATA

1971 IHC D3GAS 5.65 Litre V-8 GVW 18144 KG Project 11-4133

Test Desc.	EMPTY LOAD - 7257 KG Test No.	RPM	Man. Vac.	HALF LOAD - 12473 KG Test No.	RPM	Man. Vac.	FULL LOAD - 18370 KG Test No.	RPM	Man. Vac.
00 SS	71	800	19.7	41	800	19.5	11	775	19.6
05 SS	72	1800	21.1	42	1900	21.0	12	1900	21.0
10 SS	73	1900	20.0	43	1950	20.8	13	1900	20.6
15 SS	74	1700	20.0	44	1700	19.6	14	1700	19.6
20 SS	75	2250	19.0	45	2200	18.8	15	2225	18.5
30 SS	76	2000	16.8	46	2025	15.5	16	2000	13.5
40 SS	77	2175	12.0	47	2200	10.0	17	2150	8.0
55 SS*	78	3025	5.2	48	2975	2.6	18	2750	0.5
		Period			Period			Period	
20±5	81	34.0		51	34.0		21	34.0	
30±5	82	76.0		52	76.0		22	76.0	
40±2	86	196.0		56	196.0		26	196.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

*50 mph at Full Load

APPENDIX C-10

TABLE 10-1. TRUCK 010 SUMMARY - GRAMS/KILOMETRE
1974 IHC TTGAS 7.83 Litre V-8 GVW 20412 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	11.96	1[illegible]3.9	3272	7.18	150.09	10.89	124.4	3324	7.77	150.18	12.73	149.2	3500	8.66	159.51
10 SS	5.17	[illegible].2	2146	7.70	96.19	4.66	64.3	2146	7.79	95.57	5.45	77.3	2119	7.17	95.42
15 SS	4.74	[illegible]5.5	1208	4.35	54.71	3.38	39.8	1220	4.63	54.67	3.29	41.7	1044	3.66	47.34
20 SS	3.24	34.9	935	4.01	42.27	2.83	30.1	996	5.38	44.48	3.20	34.7	976	4.78	44.00
30 SS	2.79	21.4	726	5.37	32.47	2.74	19.1	757	7.15	33.61	3.08	24.0	800	8.63	35.82
40 SS	2.70	25.0	846	12.39	37.78	3.13	27.3	941	16.54	41.99	3.68	42.6	1012	18.11	46.11
55 SS**	4.48	114.6	1018	15.02	51.23	4.29	102.4	949	16.24	47.46	4.78	138.9	1036	12.83	53.65
20±5	8.3[illegible]	42.4	825	6.39	38.82	13.30	59.0	903	10.75	43.84	17.94	125.8	904	10.44	48.95
30±5	3.[illegible]3	23.2	654	7.69	29.67	4.70	47.8	740	9.57	35.05	9.14	132.9	741	6.28	41.35
40±2	2.[illegible]0	25.3	807	12.54	36.15	3.93	54.0	896	16.92	41.99	4.23	59.9	1013	18.59	47.37
05 AVG.	2[illegible].78	216.2	1535	8.74	83.07	29.32	291.5	1675	6.55	94.08	45.44	364.7	1905	10.15	110.79
10 AVG.	[illegible]4.17	195.2	1154	8.58	64.97	24.77	301.4	1281	7.40	77.47	36.21	385.8	1523	7.70	94.84
15 AVG.	20.94	196.0	1113	10.06	62.86	23.64	276.4	1168	8.91	70.87	30.99	391.0	1384	7.83	88.60
20 AVG.	17.44	242.2	1087	9.37	64.35	20.42	330.3	1165	8.33	73.90	22.05	355.6	1224	7.90	78.28

*Fuel Consumption in Litre/100 km
**5[illegible] mph at Full and Half Loads
XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX C-10 (Cont'd.)

TABLE 10-2. TRUCK 010 SUMMARY - GRAMS/MINUTE

1974 IHC TTGAS 7.83 Litre V-8 GVW 20412 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	2.67	19.9	97	0.02	43.19	2.58	19.3	102	0.05	44.41	3.04	19.8	98	0.04	43.63
05 SS	1.73	22.3	475	1.04	162.55	1.57	17.9	479	1.12	161.56	1.84	21.6	507	1.25	172.60
10 SS	1.42	19.8	588	2.11	196.60	1.28	17.6	587	2.13	195.33	1.49	21.2	580	1.96	195.03
15 SS	1.95	18.7	498	1.79	168.29	1.39	16.3	501	1.90	167.61	1.54	19.5	490	1.72	165.74
20 SS	1.77	19.1	511	2.19	172.50	1.55	16.4	543	2.93	181.08	1.75	19.0	535	2.62	179.85
30 SS	2.26	17.3	589	4.36	196.83	2.22	15.5	613	5.80	203.39	2.51	19.6	652	7.03	217.84
40 SS	2.91	27.0	911	13.35	303.81	3.39	29.5	1019	17.92	339.66	3.99	46.2	1098	19.64	373.28
55 SS**	6.59	168.6	1498	22.11	562.86	6.28	150.1	1390	23.80	519.35	7.03	204.1	1523	18.86	588.74
20±5	4.67	23.7	461	3.57	161.90	7.46	33.1	506	6.03	183.70	10.08	70.7	508	5.87	205.38
30±5	3.21	19.4	547	6.43	185.28	3.93	40.0	619	8.02	219.22	7.59	110.3	615	5.21	256.37
40±2	2.90	28.1	898	13.95	300.23	4.36	59.9	995	18.78	347.86	4.69	66.4	1123	20.61	392.02
05 AVG.	4.12	31.0	220	1.25	88.82	4.04	40.2	231	0.90	96.80	6.16	49.4	258	1.37	112.07
10 AVG.	6.81	55.0	325	2.42	136.63	6.82	83.0	353	2.04	159.27	9.55	101.8	402	2.03	186.80
15 AVG.	8.54	79.9	454	4.10	191.40	9.25	108.2	457	3.49	207.13	11.73	148.0	524	2.96	250.38
20 AVG.	9.61	133.6	599	5.16	264.78	10.60	171.4	604	4.32	286.27	11.01	177.6	611	3.95	291.88
9-FTP						4.51	37.2	558	6.81	199.10					
9-FTP						4.58	36.3	564	6.65	200.64					
9-WOT						8.99	419.8	968	3.84	522.55					
9-WOT						8.72	377.3	959	4.08	498.37					

*Fuel Consumption in Grams/Minute

**50 mph at Full and Half Loads

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-10 (Cont'd.)

TABLE 10-3. TRUCK 010 SUMMARY - GRAMS/KILOGRAM OF FUEL

1974 IHC TTGAS 7.83 Litre V-8 GVW 20412 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG				HALF LOAD - 12473 KG				FULL LOAD - 18370 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	61.84	460.0	2251	0.55	58.13	434.6	2302	1.13	69.67	453.4	2236	0.86
05 SS	10.67	137.3	2920	6.41	9.71	110.9	2964	6.93	10.68	125.3	2939	7.27
10 SS	7.20	100.5	2989	10.73	6.54	90.1	3007	10.92	7.65	108.5	2975	10.07
15 SS	11.60	111.3	2958	10.65	8.28	97.5	2990	11.35	9.31	117.9	2955	10.36
20 SS	10.26	110.6	2963	12.70	8.53	90.7	3000	16.21	9.73	105.5	2973	14.57
30 SS	11.50	88.1	2994	22.13	10.93	76.2	3015	28.51	11.53	89.9	2992	32.27
40 SS	9.58	88.8	3000	43.94	9.98	87.0	3001	52.76	10.69	123.7	2941	52.62
55 SS*	11.70	299.5	2662	39.27	12.10	289.1	2677	45.82	11.94	346.7	2587	32.04
20±5	28.82	146.3	2848	22.06	40.62	180.4	2757	32.84	49.09	344.2	2473.	28.56
30±5	17.30	104.6	2950	34.71	17.95	182.6	2826	36.56	29.60	430.3	2399	20.34
40±2	9.65	93.7	2992	46.48	12.54	172.1	2859	53.99	11.96	169.4	2865	52.56
05 AVG.	46.41	348.6	2474	14.10	41.74	414.9	2385	9.32	54.94	440.9	2303	12.27
10 AVG.	49.83	402.4	2379	17.68	42.83	521.1	2215	12.79	51.14	544.9	2151	10.87
15 AVG.	44.62	417.7	2372.	21.44	44.68	522.5	2207	16.83	46.86	591.2	2092	11.84
20 AVG.	36.29	504.5	2262	19.50	37.01	598.6	2112	15.10	37.72	608.4	2094	13.52
9-FTP					22.67	187.1	2804	34.20				
9-FTP					22.85	181.0	2813	33.12				
9-WOT					17.20	803.4	1853	7.35				
9-WOT					17.50	757.0	1924	8.19				

*50 mph at Full and Half Loads

APPENDIX C-10 (Cont'd.)
TABLE 10-4. TRUCK 010 SUMMARY - OPERATING DATA
1974 IHC TTGAS 7.83 Litre V-8 GVW 20412 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG			HALF LOAD - 12473 KG			FULL LOAD - 18370 KG		
Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	700	19.5	41	700	19.5	11	700	19.6
05 SS	72	2400	19.1	42	2425	19.1	12	2375	19.0
10 SS	73	2550	18.3	43	2500	18.3	13	2500	18.5
15 SS	74	2150	18.1	44	2150	18.1	14	2125	18.4
20 SS	75	2025	17.9	45	2050	17.4	15	2000	17.3
30 SS	76	1800	15.1	46	1825	13.5	16	1800	14.2
40 SS	77	2400	12.8	47	2400	11.0	17	2400	9.5
55 SS*	78	2825	6.0	48	2600	4.5	18	2600	4.5
		Period			Period			Period	
20±5	81	38.0		51	38.0		21	38.0	
30±5	82	68.0		52	68.0		22	68.0	
40±2	86	96.0		56	96.0		26	96.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

*50 mph at Full and Half Loads

APPENDIX C-11 (Cont'd.)

TABLE 11-3. TRUCK 011 SUMMARY - GRAMS/KILOGRAM OF FUEL
1974 Chevrolet D3GAS 6.00 Litre V-8 GVW 18598 KG Project 11-4133

Test	EMPTY LOAD - 5216 KG				HALF LOAD - 12473 KG				FULL LOAD - 18370 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	25.01	329.3	2573	1.03	34.59	306.5	2578	1.15	59.21	437.5	2294	1.02
05 SS	2.82	61.7	3063	3.04	2.72	68.9	3053	4.18	3.69	64.2	3057	3.40
10 SS	8.30	204.7	2821	4.48	7.98	214.1	2808	5.28	8.00	210.8	2813	4.79
15 SS	9.41	229.6	2779	4.82	9.51	245.0	2754	5.73	9.24	209.6	2811	5.76
20 SS	10.44	244.5	2752	5.70	10.85	251.9	2739	7.05	10.83	230.3	2773	7.66
30 SS	10.96	254.5	2735	9.67	11.29	233.0	2767	14.77	11.30	241.5	2754	17.71
40 SS	12.11	262.7	2718	15.94	12.68	243.4	2747	27.36	12.62	211.5	2797	33.15
55 SS*	11.76	224.7	2779	28.94	13.18	234.1	2760	42.83	13.85	281.1	2684	39.00
20±5	10.38	228.5	2777	8.28	29.72	215.9	2736	18.82	29.56	233.0	2710	23.01
30±5	10.33	233.3	2770	12.27	12.01	184.8	2841	24.81	19.37	224.0	2756	26.76
40±2	13.08	262.7	2715	18.35	13.64	251.1	2732	23.95	12.89	213.7	2793	34.09
05 AVG.	26.41	238.8	2710	10.62	26.61	275.1	2653	13.85	43.44	320.1	2529	13.28
10 AVG.	26.50	236.6	2714	14.45	29.04	254.4	2678	19.63	30.18	293.2	2613	19.88
15 AVG.	25.79	227.3	2731	20.97	23.59	240.7	2716	26.94	27.38	305.3	2603	25.93
20 AVG.	21.38	205.6	2779	27.96	22.55	256.1	2695	26.65	24.83	373.1	2504	23.24
9-FTP					26.16	217.5	2745	19.61				
9-FTP					24.73	234.5	2723	16.15				
9-WOT					15.18	231.9	2757	45.54				
9-WOT					13.53	287.0	2675	33.93				

*50 mph at Full Load and 53 mph at Half Load

APPENDIX C-11

TABLE 11-1. TRUCK 011 SUMMARY - GRAMS/KILOMETRE

1974 Chevrolet D3GAS 6.00 Litre V-8 GVW 18598 KG Project 11-4133

Test	EMPTY LOAD - 5216 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	2.24	49.0	2431	2.70	106.28	2.28	57.9	2565	3.51	112.54	2.76	48.1	2292	2.55	100.42
10 SS	3.91	96.5	1330	2.11	63.14	4.13	110.9	1454	2.73	69.37	3.23	85.3	1138	1.94	54.18
15 SS	3.43	83.7	1013	1.76	48.80	3.61	93.1	1047	2.18	50.91	3.28	74.3	997	2.04	47.50
20 SS	2.99	69.9	787	1.63	38.32	3.06	71.0	772	1.99	37.77	3.25	69.1	832	2.30	40.17
30 SS	2.68	62.4	670	2.37	32.82	2.91	60.0	713	3.80	34.50	3.08	65.8	751	4.83	36.51
40 SS	2.63	57.1	590	3.46	29.08	3.11	59.7	674	6.72	32.87	3.54	59.2	783	9.28	37.50
55 SS**	2.47	47.1	583	6.07	28.10	3.70	65.7	775	12.02	37.60	4.28	87.0	830	12.07	41.44
20±5	2.93	64.5	784	2.34	37.81	9.51	69.1	875	6.02	42.85	10.36	81.7	950	8.07	46.94
30±5	2.34	52.8	627	2.78	30.30	3.04	46.7	718	6.27	33.85	5.37	62.1	764	7.42	37.13
40±2	2.56	51.5	532	3.60	26.25	3.26	60.0	653	5.73	32.03	3.54	58.7	767	9.36	36.78
05 AVG.	14.89	134.7	1528	5.99	75.53	18.44	190.6	1838	9.60	92.82	28.94	213.3	1685	8.85	89.25
10 AVG.	11.22	100.2	1149	6.12	56.70	14.20	124.4	1309	9.60	65.49	17.18	166.9	1487	11.32	76.24
15 AVG.	9.50	83.8	1006	7.73	49.36	11.34	115.7	1305	12.95	64.36	15.34	171.1	1458	14.53	75.05
20 AVG.	6.76	65.0	879	8.84	42.35	9.06	102.9	1083	10.71	53.80	12.02	180.7	1213	11.26	64.87

*Fuel Consumption in Litre/100 km

**50 mph at Full Load and 53 mph at Half Load

XX SS - Steady State at designated speed

XX ±Y - Sinusoidal with designated average speed and amplitude

XX AVG. - Driving Cycle with designated average speed

APPENDIX C-11 (Cont'd.)

TABLE 11-2. TRUCK 011 SUMMARY - GRAMS/MINUTE

1974 Chevrolet D3GAS 6.00 Litre V-8 GVW 18598 KG Project 11-4133

Test Desc.	EMPTY LOAD - 5216 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	1.02	13.5	105	0.04	40.86	1.34	11.9	100	0.04	38.76	2.32	17.1	90	0.04	39.17
05 SS	0.31	6.7	332	0.37	108.44	0.31	7.9	351	0.48	115.02	0.38	6.6	313	0.35	102.54
10 SS	1.07	26.4	364	0.58	129.05	1.13	30.4	398	0.75	141.78	0.88	23.3	311	0.53	110.55
15 SS	1.41	34.3	415	0.72	149.38	1.48	38.2	430	0.89	155.95	1.34	30.5	409	0.8[illegible]	145.50
20 SS	1.61	37.7	425	0.88	154.33	1.65	38.3	416	1.07	152.00	1.75	37.2	448	1.24	161.67
30 SS	2.18	50.7	544	1.92	199.09	2.36	48.7	579	3.09	209.11	2.50	53.5	610	3.92	221.47
40 SS	2.83	61.5	636	3.73	234.09	3.35	64.3	726	7.23	264.34	3.81	63.8	844	10.00	301.62
55 SS**	3.66	69.8	864	9.00	310.87	5.27	93.6	1104	17.13	399.96	5.79	117.6	1122	16.31	418.18
20±5	1.62	35.5	432	1.29	155.58	5.24	38.1	482	3.32	176.29	5.67	44.7	519	4.41	191.68
30±5	1.91	43.1	512	2.27	184.83	2.52	38.8	597	5.21	210.11	4.40	50.9	626	6.08	227.19
40±2	2.83	56.8	587	3.97	216.27	3.47	63.9	696	6.10	254.68	3.88	64.3	840	10.26	300.93
05 AVG.	2.08	18.8	213	0.83	78.60	2.49	25.8	248	1.30	93.61	3.77	27.8	219	1.15	86.75
10 AVG.	2.99	26.7	306	1.63	112.88	3.67	32.2	339	2.48	126.50	4.36	42.4	378	2.87	144.49
15 AVG.	3.77	33.2	399	3.06	146.05	4.33	44.2	499	4.95	183.66	5.41	60.3	514	5.13	197.64
20 AVG.	3.55	34.1	461	4.64	166.03	4.56	51.8	545	5.39	202.27	5.71	85.9	576	5.35	230.10
9-FTP						3.64	30.2	382	2.73	139.00					
9-FTP						3.55	33.7	391	2.32	143.59					
9-WOT						5.10	77.8	925	15.28	335.60					
9-WOT						4.87	103.4	964	12.22	360.13					

*Fuel Consumption in Grams/Minute

**50 mph at Full Load and 53 mph at Half Load

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-11 (Cont'd.)

TABLE 11-4. TRUCK 011 SUMMARY - OPERATING DATA

1974 Chevrolet D3GAS 6.00 Litre V-8 GVW 18598 KG Project 11-4133

	EMPTY LOAD - 5216 KG			HALF LOAD - 12473 KG			FULL LOAD - 18370 KG		
Test Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	650	16.3	41	650	16.3	11	680	16.5
05 SS	72	1900	17.6	42	1950	17.5	12	1850	17.5
10 SS	73	2300	18.2	43	2350	18.0	13	2300	17.8
15 SS	74	2375	17.7	44	2400	17.6	14	2350	17.5
20 SS	75	2300	17.2	45	2250	16.8	15	2300	16.5
30 SS	76	2550	16.1	46	2450	14.5	16	2500	13.5
40 SS	77	2500	13.5	47	2500	11.0	17	2450	9.0
55 SS*	78	3000	11.0	48	2800	5.3	18	2650	6.0
		Period			Period			Period	
20±5	81	42.0		51	42.0		21	42.0	
30±5	82	72.0		52	72.0		22	72.0	
40±2	86	168.0		56	168.0		26	168.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX C-12

TABLF 12-1. TRUCK 012 SUMMARY - GRAMS/KILOMFTRE

1972 Ford TTGAS 7.82 Litre V-8 GVW 20412 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	22.36	786.2	2122	1.72	144.86	23.39	870.3	2214	3.01	154.48	22.65	770.3	1902	1.19	134.57
10 SS	12.99	449.3	1387	1.55	90.17	13.69	498.3	1399	2.38	94.05	12.67	425.2	1253	1.29	82.89
15 SS	8.34	273.6	758	0.71	51.30	8.87	313.5	757	0.75	53.99	8.75	293.0	706	0.58	50.45
20 SS	6.72	209.3	603	0.78	40.28	7.24	250.2	626	0.94	44.02	7.22	231.6	638	0.89	43.29
30 SS	6.33	172.7	723	3.01	42.88	6.43	175.2	778	4.09	45.38	6.66	173.0	822	4.68	47.11
40 SS	5.75	138.2	754	6.07	41.82	6.04	130.0	814	8.15	43.86	6.76	183.3	898	6.86	51.03
55 SS**	7.74	323.3	839	1.96	57.95	7.89	369.2	906	2.48	63.87	9.20	389.4	866	1.82	63.67
20±5	16.09	203.5	685	2.28	44.62	24.90	231.2	754	3.46	50.57	29.28	319.8	829	2.91	60.18
30±5	6.44	161.8	769	4.75	44.11	8.50	222.3	786	3.99	49.12	12.60	273.1	822	3.21	54.58
40±2	5.91	143.2	759	6.02	42.38	6.19	151.7	822	5.98	45.62	7.36	201.7	890	7.47	52.01
05 AVG.	34.88	491.7	1211	3.80	88.51	35.00	530.1	1375	3.31	98.00	38.84	617.7	1647	3.51	115.82
10 AVG.	27.11	359.0	990	3.04	69.29	29.01	470.4	1113	3.16	82.15	30.73	526.0	1274	3.59	92.88
15 AVG.	24.75	342.2	909	2.97	64.46	25.14	464.5	1059	3.23	78.97	26.50	510.9	1216	3.68	88.86
20 AVG.	18.22	315.8	891	3.16	61.06	20.06	421.3	956	2.90	71.05	20.91	463.8	1117	3.58	80.82

*Fuel Consumption in Litre/100 km
**48 mph at Full Load and 53 mph at Half Load

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX C-12 (Cont'd.)

TABLE 12-2. TRUCK 012 SUMMARY - GRAMS/MINUTE

1972 Ford TTGAS 7.82 Litre V-8 GVW 20412 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	1.11	37.6	87	0.03	47.33	1.12	41.0	82	0.04	47.39	1.38	32.3	87	0.04	44.88
05 SS	3.23	113.7	307	0.25	156.49	3.38	125.8	320	0.43	166.74	3.28	111.6	275	0.17	145.49
10 SS	3.75	129.8	401	0.45	194.50	3.97	144.3	405	0.69	203.37	3.68	123.6	365	0.38	180.00
15 SS	3.49	114.5	317	0.30	160.23	3.71	131.3	317	0.31	168.77	3.67	122.8	296	0.24	157.83
20 SS	3.73	116.2	335	0.43	166.95	4.02	138.8	347	0.52	182.30	3.89	124.8	344	0.48	174.21
30 SS	5.19	141.6	593	2.47	262.50	5.28	143.8	638	3.36	278.00	5.35	139.1	661	3.76	282.95
40 SS	6.19	148.9	812	6.54	336.30	6.51	140.1	878	8.79	392.98	7.33	198.9	975	7.44	413.42
55 SS**	11.58	483.7	1255	2.94	647.48	11.12	520.2	1277	3.50	671.88	12.06	510.2	1134	2.38	622.89
20±5	8.92	112.8	380	1.26	184.61	13.72	127.4	416	1.90	207.98	16.00	174.7	453	1.59	245.47
30±5	5.32	133.5	635	3.92	271.71	6.98	182.6	646	3.28	301.30	10.23	221.8	668	2.61	330.94
40±2	6.45	156.1	828	6.56	345.01	6.74	165.1	894	6.50	370.76	7.99	218.8	966	8.10	421.18
05 AVG.	4.86	68.5	169	0.53	92.02	4.83	73.2	190	0.46	100.96	5.21	82.9	221	0.47	116.04
10 AVG.	7.48	99.1	273	0.84	142.76	7.94	128.8	305	0.86	167.92	7.69	131.6	319	0.90	173.54
15 AVG.	9.76	134.9	358	1.17	189.74	9.79	180.9	412	1.26	229.58	9.83	189.4	451	1.36	246.01
20 AVG.	9.74	168.9	476	1.69	243.78	10.29	216.1	490	1.49	272.04	9.99	221.5	534	1.71	288.16
9-FTP						6.99	105.7	412	2.12	189.25					
9-FTP						7.33	91.5	415	2.14	183.62					
9-WOT						11.89	466.7	985	3.30	554.14					
9-WOT						12.34	490.6	994	2.79	569.20					

*Fuel Consumption in Grams/Minute

**48 mph at Full Load and 53 mph at Half Load

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-12 (Cont'd.)

TABLE 12-3. TRUCK 012 SUMMARY - GRAMS/KILOGRAM OF FUEL
1972 Ford TTGAS 7.82 Litre V-8 GVW 20412 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG				HALF LOAD - 12473 KG				FULL LOAD - 18370 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	23.37	794.6	1847	0.66	23.66	864.4	1736	0.90	30.67	719.2	1942	0.94
05 SS	20.67	726.9	1962	1.59	20.28	754.6	1919	2.61	22.54	766.7	1893	1.18
10 SS	19.29	667.4	2060	2.30	19.50	709.6	1993	3.39	20.47	686.9	2025	2.09
15 SS	21.78	714.3	1978	1.86	22.01	777.7	1878	1.86	23.23	777.9	1874	1.53
20 SS	22.34	695.8	2005	2.59	22.03	761.3	1903	2.87	22.33	716.5	1973	2.75
30 SS	19.78	539.5	2259	9.39	18.98	517.2	2297	12.09	18.92	491.8	2337	13.30
40 SS	18.41	442.6	2416	19.44	18.45	397.0	2487	24.90	17.74	481.1	2357	18.01
55 SS*	17.89	747.1	1939	4.53	16.55	774.2	1900	5.20	19.36	819.1	1821	3.82
20±5	48.30	610.8	2057	6.84	65.96	612.4	1998	9.15	65.16	711.8	1844	6.48
30±5	19.57	491.1	2336	14.44	23.18	606.1	2144	10.89	30.93	670.2	2018	7.89
40±2	18.68	452.4	2399	19.02	18.17	445.4	2412	17.54	18.96	519.5	2293	19.24
05 AVG.	52.78	744.0	1833	5.74	47.84	724.6	1879	4.52	44.92	714.4	1905	4.06
10 AVG.	52.41	694.0	1913	5.88	47.29	767.0	1814	5.15	44.31	758.5	1837	5.18
15 AVG.	51.42	711.0	1889	6.18	42.64	787.9	1796	5.47	39.94	770.0	1833	5.54
20 AVG.	39.96	692.8	1954	6.94	37.82	794.3	1802	5.47	34.66	768.6	1852	5.93
9-FTP					36.91	558.4	2175	11.23				
9-FTP					39.93	498.2	2260	11.66				
9-WOT					21.45	842.1	1778	5.96				
9-WOT					21.69	861.9	1746	4.90				

*48 mph at Full Load and 53 mph at Half Load

APPENDIX C-12 (Cont'd.)

TABLE 12-4. TRUCK 012 SUMMARY - OPERATING DATA

1972 Ford TTGAS 7.82 Litre V-8 GVW 20412 KG Project 11-4133

Test Desc.	EMPTY LOAD - 7257 KG Test No.	RPM	Man. Vac.	HALF LOAD - 12473 KG Test No.	RPM	Man. Vac.	FULL LOAD - 18370 KG Test No.	RPM	Man. Vac.
00 SS	71	615	20.0	41	630	20.0	11	625	20.0
05 SS	72	2350	20.5	42	2425	20.3	12	2300	20.5
10 SS	73	2500	20.0	43	2600	19.7	13	2500	20.0
15 SS	74	2050	19.5	44	2150	19.5	14	2050	19.5
20 SS	75	2025	18.8	45	2000	18.4	15	2000	18.4
30 SS	76	2500	16.6	46	2550	15.7	16	2500	15.3
40 SS	77	2450	12.4	47	2500	11.2	17	2450	9.4
55 SS*	78	2900	5.0	48	2800	3.0	18	2450	2.0
		Period			Period			Period	
20±5	81	36.0		51	36.0		21	36.0	
30±5	82	60.0		52	60.0		22	60.0	
40±5	86	134.0		56	134.0		26	134.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

*48 mph at Full Load and 53 mph at Half Load

APPENDIX C-13

TABLE 13-1. TRUCK 013 SUMMARY - GRAMS/KILOMETRE

1974 GMC TTGAS 7.00 Litre V-8 GVW 20412 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	4.61	103.4	3077	5.18	137.51	3.91	101.7	3220	5.94	143.34	6.32	135.0	2281	4.66	131.54
10 SS	2.81	63.8	1788	3.94	80.19	1.87	56.2	1860	4.18	82.59	3.07	69.3	1824	4.03	82.11
15 SS	2.53	59.9	1352	4.15	61.43	1.78	50.9	1464	5.17	65.49	3.08	68.2	1407	5.01	64.40
20 SS	2.35	50.5	1053	4.47	48.15	1.77	43.0	1112	5.26	50.07	2.57	52.3	1198	6.07	54.45
30 SS	1.87	40.9	948	7.06	43.01	2.00	40.9	1000	8.06	45.24	2.38	42.2	1083	9.54	48.88
40 SS	3.00	56.7	808	10.45	38.30	2.49	33.2	910	15.32	40.99	2.64	29.3	1069	19.25	47.47
55 SS**	2.81	41.5	874	20.23	40.08	5.05	234.0	879	9.18	53.38	6.08	284.3	853	5.66	55.72
20±5	6.24	31.6	1141	11.06	51.15	5.75	60.2	1016	7.26	47.71	18.11	190.2	1262	13.20	68.37
30±5	1.84	18.8	880	9.56	38.69	2.30	37.6	803	7.64	36.75	9.83	141.8	917	10.16	49.48
40±2	2.17	27.0	847	12.07	37.86	2.40	30.9	835	12.71	37.64	2.16	29.0	1073	24.27	47.57
05 AVG.	16.67	191.4	1707	8.57	87.10	22.53	201.7	1751	11.79	90.39	24.24	267.4	1895	12.09	101.10
10 AVG.	13.01	122.6	1317	10.93	65.54	17.02	212.5	1321	10.81	72.23	21.39	358.3	1632	11.48	95.62
15 AVG.	13.82	148.7	1078	9.44	57.29	16.64	260.3	1224	10.47	71.25	18.73	345.4	1360	10.24	82.91
20 AVG.	10.81	159.0	1046	8.52	56.21	12.94	246.5	1150	11.23	66.72	14.73	358.9	1248	9.13	78.56

*Fuel Consumption in Litre/100 km
**50 mph at Full Load

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX C-13 (Cont'd.)

TABLE 13-2. TRUCK 013 SUMMARY - GRAMS/MINUTE

1974 GMC TTGAS 7.00 Litre V-8 GVW 20412 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	1.55	23.0	95	0.03	42.99	1.82	21.7	90	0.03	40.96	1.83	20.3	93	0.05	41.17
05 SS	0.63	14.1	421	0.71	140.42	0.53	13.9	439	0.81	146.00	0.87	18.5	394	0.64	134.43
10 SS	0.75	16.9	475	1.05	158.96	0.50	14.9	493	1.11	163.57	0.82	18.4	484	1.07	162.75
15 SS	1.02	24.1	544	1.67	184.50	0.72	20.5	589	2.08	196.69	1.24	27.4	566	2.02	193.40
20 SS	1.27	27.2	567	2.41	193.77	0.95	23.2	599	2.83	201.33	1.38	28.2	645	3.27	218.96
30 SS	1.51	32.9	762	5.68	258.31	1.61	32.9	804	6.48	271.72	1.88	33.3	855	7.53	288.09
40 SS	3.21	60.6	863	11.17	305.68	2.66	35.4	971	16.35	326.62	2.82	31.3	1144	20.60	379.21
55 SS **	4.14	61.2	1288	29.82	440.95	7.43	344.9	1296	13.52	587.23	7.99	373.5	1120	7.44	546.64
20±5	3.37	17.1	616	5.98	206.32	3.10	32.4	548	3.92	192.15	9.73	102.2	678	7.09	274.18
30±5	1.47	15.1	706	7.67	231.75	1.86	30.5	651	6.19	222.35	7.84	113.0	731	8.10	294.45
40±2	2.31	28.8	904	12.89	301.85	2.63	33.9	916	13.95	308.41	2.35	31.5	1164	26.33	385.30
05 AVG.	2.24	25.7	229	1.15	87.31	3.05	27.3	237	1.60	91.41	3.25	35.9	254	1.62	101.33
10 AVG.	3.60	33.9	364	3.02	135.27	4.66	58.2	362	2.96	147.64	5.77	96.6	440	3.09	192.47
15 AVG.	5.46	58.7	426	3.73	168.93	6.54	102.2	481	4.11	208.91	7.06	130.2	512	3.86	233.23
20 AVG.	5.74	84.4	556	4.53	222.90	6.90	131.5	614	5.99	265.70	7.41	180.5	628	4.59	295.02
9-FTP						3.73	34.4	425	3.82	154.86					
9-FTP						3.84	36.2	429	4.02	157.28					
9-WOT						7.16	335.8	925	5.24	465.52					
9-WOT						7.20	358.5	951	4.27	485.15					

*Fuel Consumption in Grams/Minute

**50 mph at Full Load

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-13 (Cont'd.)

TABLE 13-3. TRUCK 013 SUMMARY - GRAMS/KILOGRAM OF FUEL

1974 GMC TTGAS 7.00 Litre V-8 GVW 20412 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG				HALF LOAD - 12473 KG				FULL LOAD - 18370 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	36.12	535.1	2214	0.73	44.33	530.5	2195	0.74	44.51	492.0	2255	1.28
05 SS	4.49	100.7	2997	5.04	3.66	95.1	3008	5.55	6.44	137.5	2933	4.74
10 SS	4.70	106.6	2987	6.58	3.04	91.1	3017	6.78	5.01	113.0	2976	6.58
15 SS	5.51	130.6	2947	9.06	3.65	104.1	2994	10.57	6.40	141.9	2926	10.42
20 SS	6.55	140.5	2928	10.44	4.74	115.1	2974	14.08	6.32	128.6	2947	14.92
30 SS	5.83	127.3	2951	21.97	5.93	121.0	2960	23.85	6.52	115.7	2967	26.14
40 SS	10.50	198.3	2824	36.54	8.14	108.5	2973	50.07	7.44	82.7	3016	54.31
55 SS*	9.38	138.8	2922	67.62	12.66	587.3	2207	23.03	14.62	683.3	2049	13.62
20±5	16.34	82.8	2987	28.97	16.15	168.9	2853	20.38	35.48	372.6	2471	25.85
30±5	6.36	65.0	3047	33.09	8.37	137.2	2927	27.83	26.61	383.9	2482	27.50
40±2	7.66	95.5	2995	42.69	8.52	109.9	2970	45.23	6.09	81.6	3022	68.34
05 AVG.	25.63	294.4	2626	13.18	33.38	298.8	2594	17.46	32.11	354.2	2511	16.02
10 AVG.	26.60	250.5	2692	22.35	31.56	394.0	2450	20.04	29.96	501.9	2286	16.08
15 AVG.	32.30	347.7	2521	22.07	31.29	489.3	2301	19.69	30.26	558.0	2197	16.54
20 AVG.	25.76	378.8	2493	20.30	25.98	494.9	2309	22.54	25.12	611.9	2128	15.56
9-FTP					24.08	222.2	2744	24.66				
9-FTP					24.40	230.1	2731	25.53				
9-WOT					15.38	721.3	1987	11.27				
9-WOT					14.84	739.0	1961	8.81				

*50 mph at Full Load

APPENDIX C-13 (Cont'd.)

TABLE 13-4. TRUCK 013 SUMMARY - OPERATING DATA

1974 GMC TTGAS 7.00 Litre V-8 GVW 20412 KG Project 11-4133

	EMPTY LOAD - 7257 KG			HALF LOAD - 12473 KG			FULL LOAD - 18370 KG		
Test Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	680	18.5	41	650	18.0	11	650	18.0
05 SS	72	2300	18.9	42	2300	18.7	12	2300	19.0
10 SS	73	2475	18.6	43	2500	18.2	13	2500	18.5
15 SS	74	2725	18.3	44	2750	17.8	14	2750	18.0
20 SS	75	2775	17.9	45	2790	17.3	15	2790	17.0
30 SS	76	3000	15.6	46	3000	15.7	16	3000	14.5
40 SS	77	2850	13.2	47	2850	11.5	17	2850	9.7
55 SS*	78	2850	6.0	48	2850	3.5	18	2550	2.0
		Period			Period			Period	
20±5	81	28.0		51	28.0		21	28.0	
30±5	82	50.0		52	50.0		22	50.0	
40±2	86	88.0		56	88.0		26	88.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

*50 mph at Full Load

APPENDIX C-14

TABLE 14-1. TRUCK 014 SUMMARY - GRAMS/KILOMETRE

1969 Ford TTGAS 6.41 Litre V-8 GVW 19051 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NOx	Fuel*	HC	CO	CO2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	5.19	341.1	3552	3.93	173.44	5.31	313.2	3548	4.62	171.46	6.27	313.4	4336	6.49	204.88
10 SS	2.78	188.7	2050	2.75	99.55	2.69	174.4	2122	3.02	101.60	3.89	195.6	2279	3.64	109.81
15 SS	1.90	126.1	1331	1.94	64.86	2.10	121.9	1308	2.20	63.64	3.25	126.4	1324	2.44	64.77
20 SS	1.52	97.3	1031	1.88	50.23	1.65	90.7	1055	2.19	50.85	2.37	91.8	1070	2.61	51.64
30 SS	0.58	57.1	890	2.48	41.50	0.67	59.0	954	2.08	44.33	0.96	49.0	1045	2.58	47.55
40 SS	0.02	24.9	985	2.08	43.29	0.23	75.8	1170	4.92	54.50	1.99	125.9	1068	4.71	53.77
55 SS**	2.97	156.7	714	3.11	40.99	6.18	333.3	720	1.67	53.40	6.84	359.7	795	1.95	58.39
20±5	3.54	105.7	1173	1.83	57.07	11.01	161.6	1115	3.13	59.32	12.10	280.5	1140	3.06	68.41
30±5	0.73	58.7	871	1.63	40.81	2.75	99.5	820	2.82	41.62	6.77	214.8	845	2.20	50.90
40±2	0.30	31.3	903	1.85	40.28	1.17	68.3	1000	3.23	46.95	3.68	201.6	1048	3.95	58.18
05 AVG.	45.50	463.2	1824	3.39	113.92	44.41	471.7	1828	3.67	114.54	48.87	567.9	2041	4.22	130.50
10 AVG.	27.57	323.6	1355	2.38	82.45	35.19	394.3	1447	3.02	92.03	32.52	474.5	1678	3.82	106.77
15 AVG.	26.36	284.9	1096	2.18	68.75	28.89	355.5	1234	3.07	79.61	30.10	464.4	1471	3.79	97.05
20 AVG.	17.25	283.4	921	1.93	60.07	23.99	354.4	1122	2.84	74.16	23.54	425.4	1277	3.50	85.38

*Fuel Consumption in Litre/100 km

**48 mph at Full Load and 52 mph at Half Load

XX SS - Steady State at designated speed

XX ±Y - Sinusoidal with designated average speed and amplitude

XX AVG. - Driving Cycle with designated average speed

APPENDIX C-14 (Cont'd.)

TABLE 14-2. TRUCK014 SUMMARY - GRAMS/MINUTE

1969 Ford TTGAS 6.41 Litre V-8 GVW 19051 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	2.88	39.7	107	0.03	56.40	4.08	45.4	104	0.04	59.52	3.37	42.3	107	0.06	58.15
05 SS	0.71	46.7	486	0.54	177.25	0.77	45.4	514	0.67	185.37	0.91	45.3	627	0.94	221.33
10 SS	0.74	50.1	544	0.73	197.33	0.73	47.4	577	0.82	206.29	1.03	51.8	604	0.97	217.30
15 SS	0.73	48.7	514	0.75	187.14	0.83	48.0	515	0.86	187.01	1.31	50.8	532	0.98	194.37
20 SS	0.81	51.7	547	1.00	199.13	0.86	47.5	552	1.15	198.68	1.29	49.9	581	1.42	209.34
30 SS	0.46	44.9	700	1.95	243.69	0.52	45.9	741	1.61	257.18	0.77	39.4	841	2.08	285.59
40 SS	0.02	25.7	1014	2.14	332.82	0.21	71.9	1109	4.66	385.64	2.12	134.5	1141	5.03	428.87
55 SS**	4.15	219.2	999	4.34	428.01	8.05	434.1	938	2.17	519.15	8.31	437.0	966	2.36	529.60
20±5	1.97	58.9	654	1.02	237.56	5.90	86.6	598	1.68	237.36	6.40	148.3	603	1.62	270.15
30±5	0.60	48.2	715	1.34	250.21	2.17	78.6	647	2.23	245.39	5.36	170.0	669	1.74	300.69
40±2	0.32	33.7	971	1.99	323.27	1.24	72.6	1063	3.44	372.68	3.84	210.4	1094	4.12	453.29
05 AVG.	6.26	63.8	251	0.47	117.09	5.96	63.3	245	0.49	114.72	6.43	74.7	269	0.56	128.24
10 AVG.	7.72	90.6	380	0.67	172.41	9.58	107.3	394	0.82	186.98	8.12	118.5	419	0.95	199.03
15 AVG.	10.57	114.2	439	0.87	205.75	11.01	135.5	470	1.17	226.52	10.81	166.7	528	1.36	260.16
20 AVG.	9.40	154.4	502	1.05	244.43	12.28	181.3	574	1.45	283.29	11.03	199.2	598	1.64	298.60
9-FTP						4.67	83.2	373	0.93	163.69					
9-FTP						4.64	85.9	379	0.87	166.77					
9-WOT						8.36	450.4	792	1.23	481.58					
9-WOT						8.27	464.5	817	1.27	496.40					

*Fuel Consumption in Grams/Minute

**48 mph at Full Load and 52 mph at Half Load

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-14 (Cont'd.)

TABLE 14-3. TRUCK 014 SUMMARY - GRAMS/KILOGRAM OF FUEL

1969 Ford TTGAS 6.41 Litre V-8 GVW 19051 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG				HALF LOAD - 12473 KG				FULL LOAD - 18370 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	51.12	704.7	1900	0.59	68.52	762.3	1755	0.68	57.87	728.2	1842	1.03
05 SS	4.01	263.4	2743	3.04	4.15	244.7	2772	3.61	4.10	204.9	2834	4.24
10 SS	3.74	253.9	2759	3.69	3.55	229.9	2797	3.98	4.75	238.5	2780	4.44
15 SS	3.92	260.4	2748	4.02	4.42	256.5	2752	4.62	6.72	261.4	2737	5.05
20 SS	4.05	259.5	2749	5.02	4.34	238.9	2780	5.78	6.15	238.2	2776	6.76
30 SS	1.88	184.3	2874	8.00	2.01	178.4	2883	6.27	2.70	138.0	2944	7.27
40 SS	0.07	77.2	3048	6.43	0.56	186.4	2875	12.08	4.95	313.5	2661	11.74
55 SS*	9.69	512.0	2334	10.15	15.51	836.1	1806	4.19	15.68	825.1	1823	4.46
20±5	8.30	248.1	2753	4.29	24.86	364.8	2517	7.06	23.68	549.1	2231	6.00
30±5	2.38	192.6	2859	5.35	8.86	320.2	2638	9.07	17.81	565.3	2225	5.78
40±2	0.99	104.1	3003	6.15	3.33	194.9	2853	9.22	8.48	464.2	2413	9.08
05 AVG.	53.50	544.6	2144	3.98	51.94	551.6	2138	4.29	50.16	582.9	2095	4.33
10 AVG.	44.79	525.8	2201	3.86	51.22	573.9	2105	4.40	40.80	595.3	2105	4.80
15 AVG.	51.35	555.1	2134	4.25	48.61	598.1	2076	5.17	41.54	640.9	2031	5.24
20 AVG.	38.46	631.8	2055	4.30	43.33	640.1	2026	5.13	36.93	667.3	2004	5.49
9-FTP					28.54	508.3	2280	5.69				
9-FTP					27.80	515.1	2272	5.23				
9-WOT					17.36	935.2	1645	2.56				
9-WOT					16.66	935.8	1646	2.56				

*48 mph at Full Load and 52 mph at Half Load.

APPENDIX C-14 (Cont'd.)

TABLE 14-4. TRUCK 014 SUMMARY - OPERATING DATA

1969 Ford TTGAS 6.41 Litre V-8 GVW 19051 KG Project 11-4133

	EMPTY LOAD - 7257 KG			HALF LOAD - 12473 KG			FULL LOAD - 18370 KG		
Test Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	780	17.3	41	730	17.4	11	720	17.6
05 SS	72	2600	18.0	42	2700	18.0	12	2650	17.5
10 SS	73	2700	17.5	43	2750	17.5	13	2725	17.2
15 SS	74	2500	17.3	44	2500	17.4	14	2550	17.0
20 SS	75	2450	16.3	45	2400	16.5	15	2450	16.0
30 SS	76	2250	14.3	46	2200	12.0	16	2250	10.5
40 SS	77	2850	9.8	47	2820	8.0	17	2850	7.4
55 SS*	78	2800	7.5	48	2600	3.0	18	2450	1.5
		Period			**Period**			**Period**	
20±5	81	34.0		51	34.0		21	34.0	
30±5	82	70.0		52	70.0		22	70.0	
40±2	86	132.0		56	132.0		26	132.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

*48 mph at Full Load and 52 mph at Half Load

APPENDIX C-15

TABLE 15-1. TRUCK 015 SUMMARY - GRAMS/KILOMETRE

1974 GMC D3GAS 7.00 Litre V-8 GVW 20185 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	7.14	191.6	2491	2.85	118.97	11.47	420.0	2559	2.55	137.55	11.79	311.5	2839	3.61	142.24
10 SS	6.20	190.3	1704	3.26	85.46	7.14	258.7	1710	2.51	90.40	7.61	207.7	1793	3.68	90.61
15 SS	5.37	187.4	1514	4.07	77.14	6.24	231.9	1516	3.22	80.28	6.31	201.6	1577	4.42	80.86
20 SS	3.88	123.8	938	2.53	48.39	4.68	172.8	960	1.82	52.68	4.87	150.3	1029	3.00	54.11
30 SS	3.26	111.1	873	3.94	44.71	4.02	141.4	921	3.83	48.83	3.91	123.9	1001	5.55	51.06
40 SS	2.84	93.6	652	4.23	34.14	3.31	116.1	685	4.23	37.11	3.66	104.3	807	7.36	41.51
55 SS	2.73	71.1	686	7.70	34.09	3.00	76.6	744	9.78	36.92	4.69	248.6	769	3.93	49.65
20±5	12.68	116.7	1012	7.97	52.22	15.95	106.2	1270	19.40	62.86	28.26	494.1	1253	5.67	69.53
30±5	3.84	98.3	919	8.31	45.87	7.94	100.6	1013	12.28	50.57	16.84	317.7	977	6.33	64.65
40±2	2.90	93.6	604	3.86	32.11	3.25	89.1	741	7.36	37.66	3.77	111.3	789	8.76	41.24
05 AVG.	34.27	372.8	1848	7.30	107.43	37.78	415.1	1962	8.60	115.54	42.81	535.4	2183	8.68	133.54
10 AVG.	22.96	237.3	1350	7.23	75.90	26.13	333.4	1501	7.61	89.06	29.82	475.5	1642	6.89	104.97
15 AVG.	23.84	248.5	1210	8.22	70.83	22.76	350.5	1384	9.37	84.79	30.71	515.8	1545	8.66	103.65
20 AVG.	14.69	165.8	984	8.80	54.58	14.09	322.8	1098	7.09	69.73	22.40	488.8	1193	4.54	85.86

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed

XX ±Y - Sinusoidal with designated average speed and amplitude

XX AVG. - Driving Cycle with designated average speed

APPENDIX C-15 (Cont'd.)

TABLE 15-2. TRUCK 015 SUMMARY - GRAMS/MINUTE

1974 GMC D3GAS 7.00 Litre V-8 GVW 20185 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	1.47	29.7	92	0.04	45.38	3.87	42.7	84	0.01	51.65	1.58	28.2	119	0.16	53.01
05 SS	1.09	29.3	381	0.44	135.66	1.66	60.9	371	0.37	148.84	1.61	42.6	388	0.49	145.13
10 SS	1.75	53.6	480	0.92	179.82	2.01	72.9	482	0.71	190.21	2.14	58.5	505	1.04	190.48
15 SS	2.24	78.3	633	1.70	240.73	2.61	97.0	634	1.35	250.76	2.64	84.3	659	1.85	252.34
20 SS	2.19	69.7	528	1.42	203.44	2.60	96.0	533	1.01	218.51	2.70	83.4	571	1.66	224.24
30 SS	2.73	93.0	731	3.30	279.31	3.30	115.8	754	3.14	298.65	3.20	101.6	821	4.55	312.55
40 SS	3.11	102.4	713	4.62	278.87	3.60	126.1	744	4.59	300.92	3.98	113.4	877	8.00	336.88
55 SS	4.06	105.8	1021	11.45	378.76	4.41	112.8	1095	14.40	405.80	6.87	363.7	1126	5.75	542.30
20±5	7.01	64.5	560	4.41	215.57	8.55	56.9	681	10.43	251.51	15.24	266.3	675	3.06	360.31
30±5	3.11	79.5	744	6.72	277.15	6.42	81.3	819	9.92	305.13	13.60	256.6	789	5.12	389.85
40±2	3.13	100.7	650	4.16	258.03	3.49	95.5	795	7.90	301.58	4.07	120.0	851	9.44	331.92
05 AVG.	4.68	51.0	253	1.00	109.62	5.05	55.5	262	1.15	115.41	5.67	70.9	289	1.15	132.00
10 AVG.	6.13	63.3	360	1.93	151.20	6.93	88.4	398	2.02	176.26	7.59	121.0	418	1.75	199.45
15 AVG.	9.34	97.3	474	3.22	207.18	8.98	138.2	546	3.70	249.69	11.47	192.7	577	3.24	289.16
20 AVG.	7.82	88.3	524	4.68	216.89	7.43	170.1	579	3.74	274.36	11.31	246.8	602	2.29	323.66
9-FTP						4.23	88.7	396	1.46	173.19					
9-FTP						4.21	82.7	402	1.60	172.12					
9-WOT						8.51	559.1	777	0.86	530.75					
9-WOT						7.96	546.0	772	0.88	522.31					

*Fuel Consumption in Grams/Minute

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-15 (Cont'd.)

TABLE 15-3. TRUCK 015 SUMMARY - GRAMS/KILOGRAM OF FUEL
1974 GMC D3GAS 7.00 Litre V-8 GVW 20185 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG				HALF LOAD - 12473 KG				FULL LOAD - 18370 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	32.35	654.9	2038	0.85	74.89	827.3	1632	0.16	29.79	531.8	2239	3.09
05 SS	8.03	215.7	2805	3.21	11.17	409.0	2491	2.49	11.10	293.3	2673	3.40
10 SS	9.72	298.3	2670	5.10	10.58	383.3	2534	3.71	11.25	307.1	2651	5.45
15 SS	9.32	325.4	2629	7.07	10.41	386.9	2529	5.38	10.45	334.0	2611	7.32
20 SS	10.74	342.6	2597	7.00	11.89	439.4	2441	4.62	12.06	372.1	2547	7.42
30 SS	9.77	332.9	2615	11.82	11.04	387.8	2525	10.51	10.25	325.0	2626	14.55
40 SS	11.14	367.2	2557	16.58	11.96	418.9	2473	15.25	11.80	336.6	2603	23.73
55 SS	10.72	279.3	2697	30.24	10.87	278.0	2698	35.50	12.66	670.7	2075	10.60
20±5	32.51	299.4	2596	20.45	33.98	226.2	2706	41.41	42.28	739.2	1874	8.48
30±5	11.22	286.9	2683	24.26	21.03	266.4	2684	32.53	34.90	658.1	2025	13.12
40±2	12.11	390.3	2518	16.11	11.57	316.8	2635	26.19	12.26	361.5	2562	28.44
05 AVG.	42.73	464.8	2304	9.10	43.80	481.2	2274	9.97	42.93	537.0	2190	8.71
10 AVG.	40.53	418.8	2383	12.75	39.29	501.4	2257	11.44	38.05	606.7	2095	8.79
15 AVG.	45.09	469.8	2288	15.54	35.95	553.6	2186	14.80	39.68	666.5	1996	11.19
20 AVG.	36.06	406.9	2416	21.59	27.07	620.1	2109	13.62	34.95	762.5	1861	7.08
9-FTP					24.44	511.9	2288	8.41				
9-FTP					24.46	480.2	2337	9.27				
9-WOT					16.03	1053.3	1464	1.63				
9-WOT					15.24	1045.3	1479	1.68				

APPENDIX C-15 (Cont'd.)

TABLE 15-4. TRUCK 015 SUMMARY - OPERATING DATA

1974 GMC D3GAS 7.00 Litre V-8 GVW 20185 KG Project 11-4133

	EMPTY LOAD - 7257 KG			HALF LOAD - 12473 KG			FULL LOAD - 18370 KG		
Test Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	700	18.2	41	700	18.2	11	725	18.5
05 SS	72	2200	19.8	42	2250	19.8	12	2275	19.7
10 SS	73	2650	19.5	43	2600	19.3	13	2600	19.4
15 SS	74	3200	18.4	44	3250	18.3	14	3225	18.3
20 SS	75	2550	18.8	45	2550	18.4	15	2575	18.5
30 SS	76	3175	16.3	46	3200	16.3	16	3200	16.2
40 SS	77	2500	15.3	47	2500	13.9	17	2550	12.4
55 SS	78	2750	12.0	48	2750	9.6	18	2800	6.0
		Period			Period			Period	
20±5	81	23.0		51	23.0		21	23.0	
30±5	82	38.0		52	38.0		22	38.0	
40±5	86	70.0		56	70.0		26	70.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX C-16

TABLE 16-1. TRUCK 016 SUMMARY - GRAMS/KILOMETRE

1966 Chevrolet D3GAS 6.00 Litre V-8 GVW 19051 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	6.97	238.9	3236	5.82	153.55	6.83	217.8	3304	6.82	155.01	8.59	253.4	3299	6.40	157.40
10 SS	4.21	137.9	1762	3.69	84.18	4.44	143.5	1754	3.94	84.26	4.74	146.5	1750	3.69	84.31
15 SS	2.66	89.3	1040	2.25	50.22	2.47	79.4	1043	2.52	49.69	2.94	86.0	1082	2.74	51.81
20 SS	1.97	52.6	843	2.32	39.40	1.84	44.0	858	2.84	39.42	2.05	51.7	889	3.16	41.28
30 SS	2.76	71.8	752	3.35	36.91	2.60	62.7	775	4.24	37.24	2.94	66.6	851	5.94	40.78
40 SS	2.39	51.1	648	5.52	31.10	2.61	51.5	714	7.54	33.94	2.83	53.5	814	10.93	38.33
55 SS	2.96	78.0	588	7.65	30.44	6.18	328.2	550	1.04	45.86	7.21	340.5	691	2.06	52.77
20±5	10.79	77.2	789	4.65	39.90	7.90	133.2	968	5.90	50.83	20.51	338.1	869	2.76	61.91
30±5	2.36	57.1	746	5.10	35.64	4.28	122.8	780	5.49	41.68	16.84	259.9	724	3.24	50.10
40±2	2.55	55.6	605	5.05	29.59	2.51	49.6	701	7.46	33.24	4.09	126.7	724	7.09	39.55
05 AVG.	35.69	425.0	1504	3.59	96.57	43.10	539.6	1484	3.54	104.30	46.90	664.1	1624	3.51	119.01
10 AVG.	23.93	309.8	950	2.54	63.93	29.56	364.6	1115	2.55	75.28	33.26	499.5	1253	3.71	90.59
15 AVG.	20.88	316.7	883	2.77	61.12	23.57	374.9	996	2.75	70.13	29.91	567.2	1169	2.43	91.07
20 AVG.	14.07	243.1	788	3.88	51.34	15.99	355.1	889	2.63	63.29	22.50	415.9	970	1.85	71.61

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX C-16 (Cont'd.)

TABLE 16-2. TRUCK 016 SUMMARY - GRAMS/MINUTE

1966 Chevrolet D3GAS 6.00 Litre V-8 GVW 19051 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	5.56	51.8	74	0.02	54.48	5.71	54.1	67	0.01	53.62	5.64	50.7	65	0.01	51.38
05 SS	0.95	32.7	443	0.80	156.79	0.93	29.8	452	0.93	158.29	1.18	34.7	452	0.88	160.85
10 SS	1.12	36.5	467	0.98	166.58	1.18	38.1	466	1.05	167.16	1.26	38.9	465	0.98	167.11
15 SS	1.07	35.9	418	0.91	150.83	0.99	31.9	419	1.01	149.09	1.18	34.6	435	1.10	155.61
20 SS	1.06	28.4	455	1.25	158.56	0.99	23.7	462	1.53	158.62	1.10	27.8	479	1.70	166.00
30 SS	2.20	57.2	599	2.67	219.50	2.09	50.4	623	3.41	223.70	2.37	53.5	684	4.77	244.74
40 SS	2.56	54.7	694	5.91	248.63	2.78	55.0	762	8.05	270.45	3.03	57.3	871	11.70	306.20
55 SS	4.36	114.8	866	11.26	334.56	9.10	482.8	809	1.53	503.66	10.62	501.7	1018	3.04	580.56
20±5	5.83	41.7	426	2.52	161.07	4.25	71.7	521	3.17	204.12	11.04	182.0	468	1.49	245.79
30±5	1.90	45.9	600	4.10	213.95	3.44	98.8	627	4.41	250.35	13.44	207.5	578	2.59	295.63
40±2	2.76	60.2	655	5.47	239.34	2.73	54.0	762	8.11	269.97	4.41	136.5	780	7.64	316.08
05 AVG.	4.83	57.5	203	0.49	97.50	5.89	73.7	203	0.48	106.33	6.22	88.0	215	0.46	117.79
10 AVG.	6.27	81.2	249	0.66	125.18	7.84	96.7	296	0.68	149.08	8.46	127.0	319	0.64	171.99
15 AVG.	8.12	123.1	343	1.08	177.38	9.28	147.6	392	1.08	206.08	11.12	210.9	435	0.90	252.91
20 AVG.	7.31	126.3	410	2.02	199.18	8.43	187.2	469	1.39	249.11	11.20	206.9	483	0.92	266.01
9-FTP						5.49	89.2	339	1.55	156.71					
9-FTP						5.25	85.5	335	1.59	153.42					
9-WOT						9.40	507.7	675	0.77	474.01					
9-WOT						9.92	512.1	686	0.69	480.18					

*Fuel Consumption in Grams/Minute

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-16 (Cont'd.)

TABLE 16-3. TRUCK 016 SUMMARY - GRAMS/KILOGRAM OF FUEL
1966 Chevrolet D3GAS 6.00 Litre V-8 GVW 19051 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG				HALF LOAD - 12473 KG				FULL LOAD - 18370 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	102.09	951.0	1352	0.30	106.42	109.4	1246	0.23	109.73	986.3	1272	0.19
05 SS	6.08	208.4	2823	5.07	5.90	188.2	2855	5.89	7.31	215.6	2807	5.44
10 SS	6.70	219.4	2803	5.87	7.05	228.1	2789	6.27	7.54	232.7	2780	5.87
15 SS	7.10	238.2	2773	6.00	6.67	214.1	2812	6.81	7.59	222.4	2796	7.07
20 SS	6.70	179.0	2867	7.89	6.24	149.4	2915	9.65	6.65	167.6	2885	10.26
30 SS	10.01	260.5	2728	12.15	9.36	225.5	2785	15.25	9.67	218.6	2795	19.51
40 SS	10.30	220.0	2791	23.78	10.30	203.3	2817	29.75	9.89	187.1	2844	38.21
55 SS	13.04	343.2	2589	33.66	18.06	958.7	1606	3.03	18.30	864.2	1754	5.23
20±5	36.22	259.0	2648	15.62	20.82	351.1	2552	15.55	44.38	731.6	1879	5.98
30±5	8.87	214.5	2804	19.17	13.76	394.6	2506	17.63	45.01	694.8	1935	8.67
40±2	11.52	251.5	2738	22.84	10.11	199.9	2823	30.05	13.87	429.1	2451	24.00
05 AVG.	49.50	589.5	2086	4.98	55.35	692.9	1905	4.55	52.78	747.4	1828	3.95
10 AVG.	50.13	649.0	1991	5.31	52.59	648.6	1984	4.54	49.18	738.5	1853	3.71
15 AVG.	45.75	694.0	1934	6.07	45.01	716.0	1902	5.25	43.98	834.1	1719	3.58
20 AVG.	36.70	634.1	2057	10.12	33.83	751.4	1882	5.56	42.09	777.8	1814	3.47
9-FTP					35.06	568.9	2164	9.87				
9-FTP					34.19	557.4	2185	10.34				
9-WOT					19.84	1071.0	1424	1.63				
9-WOT					20.66	1066.4	1428	1.45				

APPENDIX C-16 (Cont'd.)

TABLE 16-4. TRUCK 016 SUMMARY - OPERATING DATA

1966 Chevrolet D3GAS 6.00 Litre V-8 GVW 19051 KG Project 11-4133

	EMPTY LOAD - 7257 KG			HALF LOAD - 12473 KG			FULL LOAD - 18370 KG		
Test Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	600	16.0	41	600	16.0	11	600	15.5
05 SS	72	2750	19.1	42	2800	19.0	12	2750	19.0
10 SS	73	2850	18.9	43	2900	18.8	13	2850	18.7
15 SS	74	2550	18.6	44	2550	18.5	14	2550	18.4
20 SS	75	2500	17.7	45	2500	17.6	15	2500	17.2
30 SS	76	3025	17.2	46	3025	16.8	16	3025	15.8
40 SS	77	2900	15.0	47	2950	13.8	17	2900	11.8
55 SS	78	3050	10.5	48	3050	7.5	18	3050	3.5
		Period			Period			Period	
20±5	81	34.0		51	34.0		21	34.0	
30±5	82	52.0		52	52.0		22	52.0	
40±2	86	92.0		56	92.0		26	92.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX C-17

TABLE 17-1. TRUCK 017 SUMMARY - GRAMS/KILOMETRE

1975 IHC D2GAS 5.65 Litre V-8 GVW 7938 KG Project 11-4133

Test	EMPTY LOAD - 3855 KG					HALF LOAD - 5896 KG					FULL LOAD - 7711 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	2.31	23.7	2756	4.70	118.35	0.86	21.8	2733	4.65	117.06	0.63	14.0	2714	4.72	115.69
10 SS	0.66	13.5	1430	2.47	61.42	0.33	11.0	1473	2.50	63.01	0.33	11.3	1453	2.58	62.21
15 SS	0.41	8.9	805	1.72	34.67	0.23	8.1	777	1.67	33.40	0.21	6.9	780	1.74	33.43
20 SS	0.24	6.6	831	1.47	35.60	0.19	7.0	847	1.56	36.29	0.20	5.5	875	1.59	37.36
30 SS	0.22	6.1	660	1.65	28.33	0.22	7.1	675	1.74	29.01	0.25	6.8	699	1.98	30.04
40 SS	0.33	10.2	587	2.77	25.53	0.38	13.4	632	3.54	27.64	0.45	13.9	657	4.81	28.73
55 SS	0.03	10.8	887	7.32	38.19	0.06	13.3	986	8.25	42.57	1.11	168.4	995	6.34	53.38
20±5	6.62	22.8	891	4.11	40.07	9.36	46.6	916	4.95	43.06	10.91	120.3	1003	4.11	51.82
30±5	1.21	12.8	623	2.93	27.34	4.02	20.2	631	3.13	28.55	5.51	50.6	695	3.03	33.47
40±2	0.58	10.8	596	3.21	25.96	0.57	11.6	605	3.33	26.43	0.43	19.6	683	4.34	30.21
05 AVG.	6.00	22.2	1313	2.99	57.77	6.04	4.7	1370	3.11	59.00	8.21	37.7	1474	4.36	65.92
10 AVG.	8.13	62.3	975	3.44	46.43	7.82	48.9	1072	4.00	49.61	9.65	107.9	1126	5.30	56.03
15 AVG.	4.07	33.7	855	3.79	38.92	3.77	24.6	902	4.18	40.26	5.04	64.5	940	4.39	44.67
20 AVG.	4.05	39.3	830	4.56	38.22	3.87	36.0	900	4.61	40.93	5.38	81.8	968	4.40	47.08

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX C-17 (Cont'd.)

TABLE 17-2. TRUCK 017 SUMMARY - GRAMS/MINUTE

1975 IHC D2GAS 5.65 Litre V-8 GVW 7938 KG Project 11-4133

Test	EMPTY LOAD - 3855 KG					HALF LOAD - 5896 KG					FULL LOAD - 7711 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.41	1.6	92	0.05	30.30	0.19	1.5	94	0.04	30.61	0.19	0.5	88	0.04	28.14
05 SS	0.32	3.2	377	0.64	120.85	0.12	3.0	374	0.64	119.53	0.09	1.9	371	0.65	118.14
10 SS	0.18	3.6	380	0.66	121.74	0.09	2.9	391	0.66	124.99	0.09	3.0	386	0.68	123.21
15 SS	0.16	3.6	324	0.69	104.22	0.09	3.3	313	0.67	100.32	0.08	2.8	314	0.70	100.49
20 SS	0.13	3.5	449	0.79	143.40	0.10	3.8	457	0.84	146.05	0.11	3.0	471	0.86	150.09
30 SS	0.18	4.9	531	1.32	170.16	0.18	5.7	542	1.40	174.08	0.20	5.5	563	1.59	180.58
40 SS	0.35	10.9	628	2.97	203.98	0.40	14.4	676	3.78	220.80	0.48	14.8	702	5.15	229.30
55 SS	0.05	1[illegible].8	1297	10.70	417.06	0.09	19.6	1451	12.14	467.50	1.64	248.0	1465	9.34	586.74
20±5	3.57	12.3	482	2.22	161.65	5.03	25.1	492	2.66	172.82	5.82	64.3	535	2.19	206.59
30±5	0.99	10.4	509	2.39	166.71	3.24	16.3	509	2.52	171.75	4.47	41.1	564	2.46	202.86
40±2	0.63	11.7	646	3.48	210.36	0.62	12.5	652	3.59	212.61	0.47	21.1	734	4.66	242.53
05 AVG.	0.84	3.1	185	0.42	60.73	0.86	0.7	195	0.44	62.77	1.15	5.3	207	0.61	68.98
10 AVG.	2.24	17.1	268	0.95	95.35	2.16	13.5	297	1.11	102.57	2.65	29.6	309	1.45	114.75
15 AVG.	1.68	14.0	354	1.57	120.29	1.55	10.1	371	1.72	123.52	2.09	26.7	389	1.82	138.05
20 AVG.	2.27	22.0	465	2.56	159.90	2.18	20.3	508	2.60	172.58	3.01	45.7	541	2.46	196.47
9-FTP						2.97	15.9	356	1.45	123.28					
9-FTP						2.90	14.5	340	1.32	117.41					
9-WOT						1.61	181.6	1039	3.92	419.62					
9-WOT						1.77	155.5	992	3.82	391.86					

*Fuel Consumption in Grams/Minute

9-FTP - Nine-Mode Federal Test Procedure

9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-17 (Cont'd.)

TABLE 17-3. TRUCK 017 SUMMARY - GRAMS/KILOGRAM OF FUEL

1975 IHC D2GAS 5.65 Litre V-8 GVW 7938 KG Project 11-4133

Test	EMPTY LOAD - 3855 KG				HALF LOAD - 5896 KG				FULL LOAD - 7711 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	13.68	51.4	3045	1.64	6.12	48.9	3073	1.34	6.86	19.4	3117	1.50
05 SS	2.62	26.8	3119	5.32	0.99	24.9	3127	5.32	0.73	16.2	3142	5.46
10 SS	1.49	29.5	3118	5.39	0.70	23.5	3130	5.31	0.70	24.4	3129	5.56
15 SS	1.57	34.4	3110	6.64	0.92	32.6	3115	6.71	0.84	27.7	3123	6.98
20 SS	0.92	24.7	3128	5.54	0.70	25.9	3127	5.74	0.73	19.9	3136	5.71
30 SS	1.05	29.0	3120	7.78	1.04	32.7	3115	8.02	1.10	30.5	3118	8.82
40 SS	1.72	53.5	3080	14.55	1.82	65.1	3061	17.13	2.11	64.7	3061	22.44
55 SS	0.12	37.9	3110	25.66	0.20	41.9	3103	25.96	2.80	422.7	2496	15.92
20±5	22.12	76.2	2980	13.75	29.10	145.1	2849	15.39	28.19	311.1	2591	10.62
30±5	5.93	62.6	3052	14.36	18.85	94.7	2961	14.68	22.05	202.5	2781	12.13
40±2	3.00	55.8	3072	16.57	2.90	58.6	3068	16.87	1.93	87.0	3027	19.23
05 AVG.	13.90	51.5	3044	6.94	13.71	10.6	3109	7.06	16.67	76.7	2996	8.85
10 AVG.	23.44	179.8	2812	9.93	21.11	132.0	2895	10.80	23.08	258.0	2691	12.66
15 AVG.	14.00	116.0	2943	13.04	12.53	81.7	3001	13.92	15.12	193.4	2818	13.17
20 AVG.	14.18	137.8	2908	15.99	12.65	117.8	2944	15.09	15.30	232.8	2755	12.52
9-FTP					24.07	129.1	2890	11.72				
9-FTP					24.74	123.8	2896	11.21				
9-WOT					3.85	432.8	2477	9.33				
9-WOT					4.53	396.9	2531	9.74				

APPENDIX C-17 (Cont'd.)
TABLE 17-4. TRUCK 017 SUMMARY - OPERATING DATA
1975 IHC D2GAS 5.65 Litre V-8 GVW 7938 KG Project 11-4133

	EMPTY LOAD - 3855 KG			HALF LOAD - 5896 KG			FULL LOAD - 7711 KG		
Test Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	600	19.5	41	600	19.0	11	620	19.5
05 SS	72	2350	20.0	42	2350	20.0	12	2350	20.0
10 SS	73	2300	19.5	43	2300	19.5	13	2300	19.5
15 SS	74	1750	19.4	44	1750	19.3	14	1750	19.2
20 SS	75	2300	17.8	45	2300	17.5	15	2300	17.5
30 SS	76	2100	14.8	46	2100	14.2	16	2125	13.8
40 SS	77	2050	10.8	47	2050	10.1	17	2050	9.4
55 SS	78	2800	6.5	48	2800	4.5	18	2800	3.0
		Period			Period			Period	
20±5	81	17.0		51	17.0		21	17.0	
30±5	82	33.0		52	33.0		22	33.0	
40±2	86	66.0		56	66.0		26	66.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX C-17 (Cont'd.)

TABLE 17-5. TRUCK 017 REPEAT SUMMARY - GRAMS/KILOMETRE

1975 IHC D2GAS 5.65 Litre V-8 GVW 7938 KG Project 11-4133

Test	EMPTY LOAD - 3855 KG					HALF LOAD - 5896 KG					FULL LOAD - 7711 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	0.93	21.8	2651	4.66	113.62	0.67	23.2	2895	4.40	123.97	0.75	26.5	2662	5.08	114.38
10 SS	0.48	11.1	1449	2.37	62.03	0.34	13.2	1527	2.43	65.44	0.39	13.5	1444	2.90	61.96
15 SS	0.31	7.3	777	1.62	33.37	0.22	8.7	805	1.91	34.65	0.24	9.9	784	1.84	33.82
20 SS	0.24	5.3	832	1.41	35.56	0.24	7.1	882	1.50	37.78	0.20	7.9	886	1.66	37.98
30 SS	0.30	5.4	657	1.70	28.15	0.25	7.8	685	1.77	29.50	0.23	8.8	683	1.94	29.48
40 SS	0.43	9.0	609	3.03	26.38	0.43	11.2	645	3.89	28.04	0.52	15.5	680	5.15	29.84
55 SS	0.06	13.2	814	6.39	35.29	0.06	15.2	909	7.26	39.44	1.00	143.9	934	5.03	49.15
20±5	7.33	21.4	819	3.36	37.03	8.26	35.5	890	4.64	41.09	10.25	111.3	976	3.99	49.99
30±5	0.79	10.4	606	2.51	26.40	3.19	19.1	649	3.36	29.12	6.16	48.5	671	2.90	32.42
40±2	0.58	9.7	587	2.81	25.51	0.63	10.9	611	3.56	26.63	0.59	19.2	672	4.09	29.77
05 AVG.	5.55	31.0	1335	2.91	59.23	6.22	20.8	1393	3.40	61.08	6.24	37.0	1423	4.22	63.43
10 AVG.	7.58	55.3	978	3.57	46.03	8.32	62.3	1002	3.77	47.60	10.18	106.4	1089	4.45	54.46
15 AVG.	3.56	31.2	820	3.61	37.20	3.97	32.4	862	4.07	39.12	4.98	61.4	919	4.16	43.57
20 AVG.	3.71	42.7	814	4.27	37.72	3.65	42.6	834	4.41	38.54	5.14	75.9	967	4.42	46.60

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed

XX ±Y - Sinusoidal with designated average speed and amplitude

XX AVG. - Driving Cycle with designated average speed

APPENDIX C-17 (Cont'd.)

TABLE 17-6. TRUCK 017 REPEAT SUMMARY - GRAMS/MINUTE

1975 IHC D2GAS 5.65 Litre V-8 GVW 7938 KG Project 11-4133

Test	EMPTY LOAD - 3855 KG					HALF LOAD - 5896 KG					FULL LOAD - 7711 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.19	0.4	92	0.05	29.43	0.19	0.6	94	0.05	30.01	0.04	0.3	88	0.05	27.92
05 SS	0.13	3.0	363	0.64	116.02	0.09	3.2	396	0.60	126.58	0.10	3.6	364	0.70	116.89
10 SS	0.13	2.9	385	0.63	122.95	0.09	3.5	406	0.64	129.83	0.10	3.6	383	0.77	122.82
15 SS	0.12	2.9	313	0.65	100.23	0.09	3.5	324	0.77	104.14	0.10	4.0	315	0.74	101.58
20 SS	0.13	2.9	449	0.76	143.12	0.13	3.8	475	0.81	152.04	0.11	4.3	477	0.90	152.86
30 SS	0.24	4.4	528	1.37	169.07	0.20	6.3	551	1.43	177.18	0.18	7.1	549	1.56	177.05
40 SS	0.46	9.6	651	3.24	210.60	0.46	12.0	689	4.16	223.85	0.56	16.6	728	5.51	238.36
55 SS	0.08	19.4	1199	9.41	387.93	0.09	22.4	1340	10.70	433.84	1.48	212.8	1380	7.43	542.47
20±5	3.94	11.5	440	1.80	148.51	4.46	19.2	480	2.50	165.53	5.55	60.2	528	2.16	202.10
30±5	0.63	8.4	486	2.01	158.20	2.57	15.4	523	2.71	175.18	4.97	39.1	541	2.34	195.01
40±2	0.63	10.4	633	3.03	205.64	0.67	11.6	653	3.81	212.38	0.63	20.5	721	4.38	238.17
05 AVG.	0.78	4.4	188	0.41	62.27	0.88	2.9	196	0.48	64.30	0.87	5.2	198	0.59	65.91
10 AVG.	2.10	15.3	271	0.99	95.10	2.27	17.0	274	1.03	97.10	2.76	28.9	296	1.21	110.35
15 AVG.	1.47	12.9	339	1.49	114.84	1.63	13.3	354	1.67	119.83	2.02	24.9	373	1.69	131.90
20 AVG.	2.09	24.0	457	2.40	158.31	2.03	23.7	463	2.45	159.98	2.84	41.9	535	2.44	192.31

*Fuel Consumption in Grams/Minute

APPENDIX C-17 (Cont'd.)

TABLE 17-7. TRUCK 017 REPEAT SUMMARY - GRAMS/KILOGRAM OF FUEL

1975 IHC D2GAS 5.65 Litre V-8 GVW 7938 KG Project 11-4133

Test	EMPTY LOAD - 3855 KG				HALF LOAD - 5896 KG				FULL LOAD - 7711 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	6.47	12.9	3129	1.82	6.44	20.1	3117	1.62	1.61	10.6	3148	1.95
05 SS	1.10	25.7	3126	5.49	0.72	25.0	3128	4.75	0.87	31.1	3118	5.95
10 SS	1.03	23.9	3129	5.11	0.70	27.0	3125	4.97	0.84	29.2	3121	6.27
15 SS	1.23	29.2	3120	6.50	0.85	33.7	3114	7.38	0.96	39.0	3105	7.30
20 SS	0.89	20.0	3135	5.32	0.85	25.1	3127	5.32	0.71	28.0	3123	5.87
30 SS	1.43	25.8	3124	8.11	1.15	35.4	3110	8.05	1.04	39.9	3103	8.83
40 SS	2.17	45.8	3091	15.40	2.05	53.6	3079	18.58	2.33	69.5	3053	23.11
55 SS	0.22	50.0	3090	24.25	0.20	51.6	3088	24.66	2.74	392.3	2544	13.70
20±5	26.53	77.4	2964	12.14	26.94	115.7	2902	15.13	27.47	298.1	2614	10.68
30±5	3.99	52.8	3074	12.73	14.98	88.1	2984	15.48	25.47	200.4	2774	12.00
40±2	3.06	50.7	3080	14.75	3.16	54.8	3073	17.92	2.66	86.3	3025	18.38
05 AVG.	12.55	70.1	3019	6.58	13.64	45.6	3055	7.45	13.18	78.2	3005	8.91
10 AVG.	22.07	160.8	2847	10.38	23.40	175.3	2820	10.60	25.03	261.6	2679	10.95
15 AVG.	12.81	112.3	2952	13.01	13.59	111.0	2952	13.92	15.30	188.7	2824	12.79
20 AVG.	13.18	151.7	2889	15.17	12.68	148.1	2897	15.32	14.78	218.1	2780	12.71

APPENDIX C-17 (Cont'd.)

TABLE 17-8. TRUCK 017 ALTERNATE DRIVING CYCLE SUMMARY
1975 IHC D2GAS 5.65 Litre V-8 GVW 7938 KG Project 11-4133

Test	EMPTY LOAD - 3855 KG					HALF LOAD - 5896 KG					FULL LOAD - 7711 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel	HC	CO	CO_2	NO_x	Fuel	HC	CO	CO_2	NO_x	Fuel
							Grams/Kilometre								
05 AVG.	6.97	31.2	1466	2.81	64.98*	7.87	37.1	1473	3.12	65.78*	7.53	69.9	1526	3.99	70.12*
10 AVG.	6.21	48.8	980	3.34	45.49*	7.42	58.6	1057	3.93	49.56*	9.93	107.3	1109	4.56	55.31*
15 AVG.	4.51	31.8	875	3.48	39.71*	4.85	40.9	916	4.19	42.08*	5.21	69.4	982	4.28	46.80*
20 AVG.	4.09	44.1	824	3.99	38.32*	4.70	56.5	881	4.44	41.62*	6.33	93.6	984	4.79	48.62*
							Grams/Minute								
05 AVG.	0.89	4.0	187	0.36	61.98	1.00	4.7	188	0.40	62.65	0.95	8.8	192	0.50	65.90
10 AVG.	1.65	13.0	261	0.89	90.44	1.98	15.6	282	1.05	98.70	2.61	28.2	292	1.20	108.60
15 AVG.	1.83	12.9	355	1.41	120.37	1.96	16.5	371	1.69	127.13	2.08	27.8	393	1.71	139.72
20 AVG.	2.27	24.5	457	2.21	158.70	2.61	31.4	490	2.47	172.66	3.48	51.4	540	2.63	199.49
							Grams/Kilogram of Fuel								
05 AVG.	14.36	64.4	3023	5.79		16.02	75.6	3000	6.35		14.38	133.5	2914	7.62	
10 AVG.	18.29	143.6	2886	9.85		20.06	158.3	2857	10.63		24.04	259.8	2685	11.04	
15 AVG.	15.22	107.1	2953	11.74		15.45	130.2	2916	13.33		14.92	198.7	2810	12.26	
20 AVG.	14.29	154.3	2882	13.94		15.13	182.0	2835	14.28		17.42	257.8	2709	13.16	

*Fuel Consumption in Litre/100 km

XX AVG. - Driving Cycle with designated average speed

APPENDIX C-18

TABLE 18-1. TRUCK 018 SUMMARY - GRAMS/KILOMETRE

1975 Ford Cal. TTGAS 6.38 Litre V-8 GVW 19958 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	0.56	34.8	3299	5.34	141.82	0.82	34.8	3328	5.44	143.04	1.48	29.8	3486	5.62	149.50
10 SS	0.31	20.5	2120	2.29	90.97	0.33	19.1	2046	2.61	87.79	0.52	20.5	2164	2.49	92.89
15 SS	0.22	16.8	1601	2.18	68.81	0.24	17.8	1636	2.46	70.34	0.17	16.9	1712	2.66	73.51
20 SS	0.17	13.8	1282	2.13	55.10	0.19	13.8	1316	2.46	56.54	0.11	14.3	1333	2.63	57.28
30 SS	0.14	13.9	961	2.75	41.56	0.16	14.8	1005	3.33	43.46	0.10	18.3	1057	4.33	45.88
40 SS	0.24	13.3	887	5.16	38.39	0.28	16.2	988	7.18	42.88	0.23	19.9	1016	9.03	44.27
55 SS**	0.61	45.2	920	8.15	41.96	1.75	141.7	1008	8.49	52.23	1.79	153.8	1036	5.32	54.24
20±5	4.29	30.5	903	2.86	40.77	11.09	40.8	968	5.57	45.08	15.54	121.2	1074	3.83	55.50
30±5	0.47	20.2	990	4.81	43.22	1.33	25.1	988	7.23	43.58	6.78	98.8	980	5.29	48.87
40±2	0.17	15.4	910	5.58	39.48	0.39	21.5	976	8.68	42.73	0.43	26.7	1056	10.91	46.45
05 AVG.	14.84	159.3	2000	5.88	97.09	15.59	171.3	2098	6.94	102.14	16.51	260.3	2316	9.38	117.36
10 AVG.	11.88	167.3	1457	6.32	74.27	13.14	198.2	1598	5.86	82.43	14.94	292.3	1815	6.77	98.11
15 AVG.	10.05	172.0	1303	5.46	67.83	12.07	204.0	1400	5.73	74.33	12.16	278.6	1581	7.24	86.96
20 AVG.	7.43	144.9	1067	5.62	55.71	9.06	202.9	1322	6.81	70.54	8.55	248.7	1407	7.69	77.10

*Fuel Consumption in Litre/100 km
**49 mph at Full Load and 54 mph at Half Load

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX C-18 (Cont'd.)

TABLE 18-2. TRUCK 018 SUMMARY - GRAMS/MINUTE

1975 Ford Cal. TTGAS 6.38 Litre V-8 GVW 19958 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.17	4.1	115	0.02	38.50	0.17	7.3	117	0.06	40.57	9.92	176.4	2861	1.10	41.12
05 SS	0.08	4.8	451	0.73	144.82	0.11	4.8	455	0.74	146.06	0.20	4.1	477	0.77	152.65
10 SS	0.08	5.4	562	0.61	180.17	0.09	5.1	543	0.69	174.01	0.14	5.4	575	0.66	184.12
15 SS	0.09	6.8	644	0.88	206.67	0.10	7.2	657	0.99	211.09	0.07	6.8	688	1.07	220.58
20 SS	0.09	7.4	691	1.15	221.74	0.10	7.4	709	1.32	227.53	0.06	7.7	718	1.42	230.54
30 SS	0.11	11.2	773	2.21	249.65	0.13	11.9	809	2.68	261.27	0.08	14.7	851	3.49	275.83
40 SS	0.26	14.2	949	5.52	306.69	0.30	17.2	1050	7.63	340.27	0.25	21.2	1086	9.65	353.40
55 SS**	0.90	66.5	1354	12.00	461.26	2.52	203.7	1449	12.21	560.64	2.36	202.9	1367	7.02	534.28
20±5	2.39	17.0	503	1.59	169.58	5.88	21.6	513	2.96	178.62	8.55	66.7	591	2.11	228.16
30±5	0.38	16.3	799	3.88	260.66	1.07	70.2	795	5.83	262.09	5.58	81.2	805	4.35	299.98
40±2	0.19	17.1	1010	6.19	327.36	0.42	23.3	1057	9.40	345.58	0.46	28.6	1133	11.70	372.02
05 AVG.	2.05	22.0	276	0.81	99.95	2.14	23.6	288	0.95	104.84	2.19	34.6	307	1.25	116.34
10 AVG.	3.14	44.3	386	1.67	146.81	3.45	52.0	419	1.54	161.54	3.78	74.0	459	1.71	185.33
15 AVG.	3.98	68.0	516	2.16	200.42	4.72	79.7	547	2.24	216.88	4.54	103.9	590	2.70	242.11
20 AVG.	3.98	77.6	571	3.01	222.68	4.65	104.1	678	3.50	270.30	4.14	120.5	681	3.72	278.83
9-FTP						3.30	10.6	422	1.72	141.68					
9-FTP						3.64	11.3	433	1.72	145.82					
9-WOT						3.24	216.6	1066	2.76	446.99					
9-WOT						3.12	210.2	1084	2.89	449.17					

*Fuel Consumption in Grams/Minute
**49 mph at Full Load and 54 mph at Half Load

9-FTP - Nine-Mode Federal Test Procedure
9-WOT - Wide Open Throttle at 2000 RPM

APPENDIX C-18 (Cont'd.)

TABLE 18-3. TRUCK 018 SUMMARY - GRAMS/KILOGRAM OF FUEL
1975 Ford Cal. TTGAS 6.38 Litre V-8 GVW 19958 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG				HALF LOAD - 12473 KG				FULL LOAD - 18370 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	4.45	106.1	2989	0.47	4.14	179.8	2874	1.41	0.41	7.3	118	0.05
05 SS	0.53	32.9	3116	5.04	0.76	32.6	3116	5.09	1.33	26.7	3123	5.04
10 SS	0.46	30.1	3121	3.37	0.51	29.2	3122	3.98	0.74	29.6	3121	3.59
15 SS	0.42	32.8	3117	4.24	0.46	33.9	3115	4.68	0.31	30.8	3120	4.85
20 SS	0.42	33.5	3115	5.17	0.44	32.7	3117	5.82	0.27	33.5	3116	6.16
30 SS	0.46	44.7	3098	8.86	0.48	45.5	3096	10.25	0.30	53.5	3084	12.64
40 SS	0.85	46.3	3094	17.99	0.88	50.7	3087	22.43	0.70	60.1	3073	27.31
55 SS*	1.96	144.2	2937	26.02	4.50	363.3	2584	21.77	4.42	379.7	2559	13.14
20±5	14.09	100.3	2967	9.38	32.94	121.1	2875	16.54	37.49	292.4	2591	9.24
30±5	1.44	62.7	3066	14.90	4.08	77.2	3035	22.23	18.59	270.8	2685	14.49
40±2	0.57	52.1	3086	18.91	1.22	67.5	3060	27.20	1.24	76.9	3045	31.46
05 AVG.	20.47	219.8	2759	8.11	20.44	224.7	2752	9.10	18.84	297.1	2643	10.71
10 AVG.	21.42	301.7	2627	11.39	21.36	322.0	2596	9.52	20.39	399.1	2478	9.25
15 AVG.	19.85	339.5	2573	10.73	21.75	367.6	2523	10.33	18.73	429.1	2436	11.15
20 AVG.	17.87	348.3	2566	13.51	17.21	385.3	2509	12.94	14.85	432.0	2443	13.35
9-FTP					23.32	74.7	2978	12.14				
9-FTP					25.00	77.3	2969	11.82				
9-WOT					7.24	484.5	2385	6.17				
9-WOT					6.94	467.9	2412	6.44				

*49 mph at Full Load and 54 mph at Half Load

APPENDIX C-18 (Cont'd.)

TABLE 18-4. TRUCK 018 SUMMARY - OPERATING DATA
1975 Ford Cal. TTGAS 6.38 Litre V-8 GVW 19958 KG Project 11-4133

	EMPTY LOAD - 7257 KG			HALF LOAD - 12473 KG			FULL LOAD - 18370 KG		
Test Desc.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.	Test No.	RPM	Man. Vac.
00 SS	71	680	18.7	41	680	18.7	11	670	18.7
05 SS	72	2425	18.2	42	2450	18.2	12	2450	18.2
10 SS	73	2600	16.7	43	2575	16.7	13	2600	16.5
15 SS	74	2850	16.4	44	2875	16.2	14	2900	16.0
20 SS	75	2800	15.6	45	2825	15.4	15	2825	15.1
30 SS	76	2600	13.2	46	2600	12.6	16	2600	11.9
40 SS	77	2950	11.2	47	2950	9.8	17	2950	8.5
55 SS*	78	2950	2.8	48	2900	0.5	18	2600	0.5
		Period			Period			Period	
20±5	81	38.0		51	38.0		21	38.0	
30±5	82	58.0		52	58.0		22	58.0	
40±2	86	112.0		56	112.0		26	112.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

*49 mph at Full Load and 54 mph at Half Load

APPENDIX C-18 (Cont'd.)

TABLE 18-5. TRUCK 018 REPEAT SUMMARY - GRAMS/KILOMETRE

1975 Ford Cal. TTGAS 6.38 Litre V-8 GVW 19958 KG Project 11-4133

Test Desc.	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	2.48	40.0	3917	5.11	168.53	1.95	34.4	3653	5.59	156.93	1.35	27.8	3685	5.14	157.74
10 SS	0.58	22.9	2305	2.59	99.00	0.61	23.6	2418	2.94	103.85	0.58	22.3	2355	2.67	101.08
15 SS	0.20	32.6	1877	1.52	81.53	0.21	18.4	1850	2.81	79.43	0.21	17.1	1859	2.79	79.71
20 SS	0.15	13.4	1351	2.37	57.99	0.16	14.1	1405	2.41	60.33	0.09	14.8	1394	2.46	59.91
30 SS	0.10	13.3	1003	2.99	43.27	0.06	14.5	1043	3.46	45.04	0.11	17.7	1056	3.87	45.83
40 SS	0.10	13.1	910	5.29	39.32	0.11	15.4	1010	7.32	43.71	0.17	17.4	1051	8.30	45.59
55 SS**	0.22	22.3	946	9.10	41.48	1.61	146.1	941	10.74	49.68	1.32	128.0	1085	7.11	54.51
20±5	3.69	26.9	899	2.79	40.26	9.51	37.8	944	4.73	43.68	15.23	93.5	1026	4.36	51.60
30±5	0.33	19.0	905	4.12	39.56	1.13	20.2	996	6.88	43.60	6.51	95.6	1031	5.87	50.79
40±2	0.14	15.1	900	5.12	39.04	0.54	21.3	966	7.89	42.31	0.49	24.1	1038	10.28	45.53
05 AVG.	13.03	143.6	1980	5.18	94.96	10.81	164.4	2151	6.46	103.28	15.61	269.4	2457	9.48	123.82
10 AVG.	11.12	153.2	1446	5.40	72.75	10.49	218.8	1598	5.31	83.45	13.09	280.9	1875	7.68	99.63
15 AVG.	9.93	152.8	1273	4.77	65.28	9.77	207.9	1426	5.01	75.37	10.91	265.8	1618	7.56	87.48
20 AVG.	8.07	163.5	1129	4.87	59.66	7.54	202.3	1301	5.74	69.43	8.03	226.2	1348	7.72	73.07

*Fuel Consumption in Litre/100 km

**50 mph at Full Load and 54 mph at Half Load

XX SS - Steady State at designated speed

XX ±Y - Sinusoidal with designated average speed and amplitude

XX AVG. - Driving Cycle with designated average speed

APPENDIX C-18 (Cont'd.)

TABLE 18-6. TRUCK 018 REPEAT SUMMARY - GRAMS/MINUTE

1975 Ford Cal. TTGAS 6.38 Litre V-8 GVW 19958 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.37	8.2	115	0.05	40.79	0.30	7.8	118	0.04	41.31	0.37	7.7	117	0.03	41.21
05 SS	0.34	5.5	536	0.70	172.08	0.27	4.7	500	0.77	160.24	0.19	3.8	504	0.70	161.21
10 SS	0.15	6.1	612	0.69	196.24	0.16	6.0	617	0.75	197.92	0.15	5.9	625	0.71	200.36
15 SS	0.08	13.1	755	0.61	244.85	0.09	7.4	744	1.13	238.37	0.08	6.9	748	1.12	239.38
20 SS	0.08	7.2	728	1.28	233.38	0.08	7.6	757	1.30	242.80	0.05	8.0	751	1.32	241.10
30 SS	0.08	10.6	799	2.38	257.33	0.05	11.6	839	2.78	270.51	0.09	14.2	850	3.12	275.27
40 SS	0.11	14.0	973	5.66	314.11	0.12	16.5	1080	7.83	349.19	0.19	18.7	1132	8.94	366.66
55 SS**	0.33	32.8	1392	13.40	455.94	2.31	210.4	1355	15.47	534.11	1.75	169.9	1440	9.44	540.25
20±5	2.00	14.6	489	1.52	163.44	5.10	20.2	506	2.53	174.69	8.44	51.8	569	2.41	213.52
30±5	0.27	15.4	737	3.36	240.61	0.92	16.5	812	5.61	265.20	5.2[illegible]	76.4	823	4.69	302.77
40±2	0.15	16.3	975	5.55	316.00	0.59	23.1	1050	8.57	343.25	0.53	25.9	1112	11.02	364.34
05 AVG.	1.79	19.8	272	0.71	97.52	1.49	22.7	297	0.89	106.37	2.09	36.1	330	1.27	124.03
10 AVG.	3.06	42.2	398	1.49	149.49	2.88	60.0	438	1.45	170.81	3.33	71.4	477	1.95	189.21
15 AVG.	3.95	60.8	507	1.90	194.09	3.85	81.9	562	1.97	221.64	4.05	98.8	601	2.81	242.72
20 AVG.	4.32	87.6	605	2.61	238.58	3.87	104.0	669	2.95	266.52	3.89	109.6	653	3.74	264.33

*Fuel Consumption in Grams/Minute

**50 mph at Full Load and 54 mph at Half Load

APPENDIX C-18 (Cont'd.)

TABLE 18-7. TRUCK 018 REPEAT SUMMARY - GRAMS/KILOGRAM OF FUEL
1975 Ford Cal. TTGAS 6.38 Litre V-8 GVW 19958 KG Project 11-4133

Test	EMPTY LOAD - 7257 KG				HALF LOAD - 12473 KG				FULL LOAD - 18370 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	9.12	200.6	2825	1.19	7.18	188.0	2851	0.95	8.90	186.7	2848	0.72
05 SS	1.97	31.8	3113	4.06	1.66	29.4	3118	4.77	1.15	23.6	3129	4.36
10 SS	0.78	31.0	3118	3.51	0.79	30.5	3119	3.80	0.76	29.6	3120	3.54
15 SS	0.33	53.5	3084	2.50	0.36	31.0	3119	4.74	0.35	28.8	3123	4.69
20 SS	0.34	31.0	3119	5.47	0.35	31.4	3119	5.35	0.20	33.1	3117	5.49
30 SS	0.31	41.2	3104	9.26	0.18	43.0	3101	10.28	0.31	51.6	3087	11.32
40 SS	0.35	44.6	3098	18.02	0.34	47.3	3094	22.43	0.51	51.1	3087	24.39
55 SS*	0.71	72.0	3054	29.38	4.33	393.9	2537	28.97	3.25	314.4	2665	17.48
20±5	12.27	89.6	2990	9.28	29.17	115.8	2895	14.50	39.54	242.8	2663	11.31
30±5	1.12	64.2	3065	13.96	3.49	62.2	3061	21.15	17.18	252.2	2719	15.49
40±2	0.48	51.7	3087	17.56	1.71	67.4	3058	24.97	1.45	71.0	3053	30.24
05 AVG.	18.38	202.6	2793	7.30	14.03	213.3	2790	8.37	16.89	291.4	2658	10.25
10 AVG.	20.47	282.0	2661	9.94	16.84	351.1	2564	8.52	17.60	377.6	2520	10.32
15 AVG.	20.36	313.4	2612	9.79	17.37	369.5	2534	8.91	16.71	406.9	2477	11.57
20 AVG.	18.11	367.0	2535	10.94	14.54	390.3	2510	11.08	14.72	414.6	2471	14.16

*50 mph at Full Load and 54 mph at Half Load.

APPENDIX C-18 (Cont'd.)

TABLE 18-8. TRUCK 018 ALTERNATE DRIVING CYCLE SUMMARY

1975 Ford Cal. "TGAS 6.38 Litre V-8 GVW 19958 KG Project 11-4133

Test	EMPTY LOAD - 725. KG					HALF LOAD - 12473 KG					FULL LOAD - 18370 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel	HC	CO	CO_2	NO_x	Fuel	HC	CO	CO_2	NO_x	Fuel
						Grams/Kilometre									
05 AVG.	11.90	129.6	1866	4.04	89.06*	13.16	154.0	1952	7.24	94.46*	12.47	238.8	2131	7.44	107.60*
10 AVG.	10.58	147.5	1353	4.78	68.38*	9.82	166.8	1551	6.02	77.93*	12.09	243.6	1748	6.90	91.68*
15 AVG.	9.22	181.3	1230	4.53	65.27*	8.23	189.2	1394	6.87	72.56*	10.66	269.0	1649	8.03	88.99*
20 AVG.	8.30	195.4	1151	4.53	62.72*	7.39	197.5	1239	6.61	66.45*	9.05	252.9	1429	8.01	78.39*
						Grams/Minute									
05 AVG.	1.56	17.0	244	0.53	86.99	1.73	20.2	256	0.95	92.60	1.64	31.4	280	0.98	105.50
10 AVG.	2.88	40.2	369	1.30	139.07	2.62	44.6	414	1.61	155.44	3.08	62.0	445	1.76	174.27
15 AVG.	3.51	69.0	468	1.72	185.51	3.05	70.1	517	2.55	200.85	3.72	93.8	575	2.80	231.77
20 AVG.	4.18	98.4	580	2.28	235.94	3.60	96.2	604	3.22	241.84	4.17	116.6	659	3.69	269.78
						Grams/Kilogram of Fuel									
05 AVG.	17.90	194.9	2806	6.07		18.66	218.4	2767	10.26		15.52	297.2	2653	9.26	
10 AVG.	20.73	288.9	2650	9.37		16.88	286.7	2665	10.35		17.66	355.9	2554	10.08	
15 AVG.	18.93	372.0	2525	9.30		15.20	349.2	2572	12.69		16.05	404.8	2482	12.09	
20 AVG.	17.72	417.3	2458	9.67		14.89	398.0	2497	13.33		15.47	432.2	2441	13.68	

*Fuel Consumption in Litre/100 km

XX AVG. - Driving Cycle with designated average speed

APPENDIX C-19
GASOLINE TRUCK IDLE CO AND HC
Beckman Model 590 Infrared Vehicle Exhaust Analyzer

Truck No.	Engine	Manufacturer	CO, percent	HC, ppm Hexane
01	318	Dodge	4.6	235
02	366	Chevrolet	5.6	300
03	361	Ford	5.3	360
04	345	IHC	0.7	800
05	292	Chevrolet	0.9	1300
06	391	Ford	0.6	1350
07	392	IHC	6.3	220
08	361	Dodge	6.0	1350
09	345	IHC	3.7	150
10	478	IHC	2.9	450
11	366	Chevrolet	2.1	475
12	477	Ford	2.0	130
13	427	GMC	2.2	200
14	391	Ford	4.2	300
15	427	GMC	3.3	185
16	366	Chevrolet	5.4	650
17	345	IHC Cal.	0.5	60
18	389	Ford Cal.	1.1	65

APPENDIX C-20. MODIFIED NINE-MODE FTP RESULTS

Truck No.		Grams/Minute: Composite Bag Results Run 1	Run 2	Avg.	Modal Results Run 1	Run 2	Avg.
1	HC	3.34	3.28	3.3	3.37	3.24	3.3
	CO	33.1	33.2	33.2	37.32	42.03	39.6
	CO_2	324.	329.	326.	348.6	343.6	346.
	NO_x	3.32	2.96	3.1	3.11	2.68	2.9
	Fuel	122.0	123.4	123.	131.8	132.5	13.2
2	HC	4.47	4.18	4.3	4.25	4.12	4.2
	CO	52.0	52.0	52.0	50.61	53.24	52.0
	CO_2	422.	415.	418.	430.6	437.2	434.
	NO_x	3.02	3.19	3.1	2.86	3.20	3.0
	Fuel	163.4	161.1	162.	165.2	168.5	167.
3	HC	3.00	3.12	3.1	3.04	3.14	3.1
	CO	24.4	24.2	24.3	24.02	22.17	23.1
	CO_2	386.	379.	383.	402.6	388.5	396.
	NO_x	4.13	4.32	4.2	4.56	4.73	4.6
	Fuel	137.0	134.5	136.	142.0	136.7	139.0
4	HC	2.84	3.24	3.1	2.96	3.19	3.1
	CO	32.5	27.9	30.0	35.01	28.33	32.0
	CO_2	346.	368.	368.	384.	396.6	391.
	NO_x	2.17	2.85	2.5	2.27	2.66	2.5
	Fuel	128.0	133.3	131.	141.47	142.35	142.
5	HC	2.84	2.74	2.8	2.94	2.75	2.9
	CO	36.8	36.4	36.6	37.60	37.44	37.5
	CO_2	308.	308.	308.	311.3	300.4	306.
	NO_x	1.85	1.95	1.9	1.97	2.06	2.0
	Fuel	118.2	117.8	118.	119.8	116.08	118.
6	HC	5.14	5.51	5.3	5.36	5.75	5.6
	CO	26.1	26.4	26.2	26.19	26.24	26.2
	CO_2	418.	432.	425.	424.92	426.38	426.
	NO_x	3.93	4.03	4.0	4.42	4.61	4.5
	Fuel	150.1	155.0	153.	152.41	153.29	153.
7	HC	4.68	4.81	4.7	4.82	4.37	4.6
	CO	41.3	48.8	45.1	41.88	50.76	46.3
	CO_2	452.	424.	438.	466.1	443.5	455.
	NO_x	2.3	2.0	2.2	2.60	2.62	2.6
	Fuel	167.7	162.7	165.	172.7	169.5	171.
8	HC	6.93	7.92	7.4	8.09	8.41	8.2
	CO	62.9	62.1	62.5	66.86	61.82	64.3
	CO_2	327.	340.	333.	352.5	352.4	352.
	NO_x	2.4	2.6	2.5	2.93	3.02	3.0
	Fuel	141.4	145.8	144.	152.4	150.2	151.
9	HC	5.37	4.03	4.7	5.58	4.42	5.0
	CO	32.3	27.4	29.8	29.57	29.95	29.8
	CO_2	327.	324.	326.	337.7	331.3	334.
	NO_x	3.42	3.37	3.4	3.71	3.51	3.6
	Fuel	124.6	120.0	122.	126.8	123.8	125.

APPENDIX C-20 (Cont'd.) MODIFIED NINE-MODE FTP RESULTS

Truck No.		Grams/Minute: Composite Bag Results Run 1	Composite Bag Results Run 2	Composite Bag Results Avg.	Modal Results Run 1	Modal Results Run 2	Modal Results Avg.
10	HC	4.51	4.58	4.5	5.08	4.98	5.0
	CO	37.2	36.3	36.8	38.41	31.94	35.2
	CO_2	558.	564.	561.	568.4	570.1	569.
	NO_x	6.81	6.65	6.8	7.48	7.10	7.3
	Fuel	199.1	200.6	200.	203.5	200.7	202.
11	HC	3.64	3.55	3.6	3.60	3.28	3.4
	CO	30.2	33.7	32.0	29.29	33.13	31.2
	CO_2	382.	391.	387.	390.	392.	391.
	NO_x	2.73	2.32	2.5	3.21	2.87	3.0
	Fuel	139.0	143.6	141.	141.2	143.4	142.
12	HC	6.99	7.33	7.2	6.98	7.28	7.1
	CO	105.7	91.5	98.6	101.46	102.65	102.0
	CO_2	412.	415.	414.	417.3	412.3	415.
	NO_x	2.12	2.14	2.1	2.68	2.52	2.6
	Fuel	189.3	183.6	187.	189.	188.2	189.
13	HC	3.73	3.84	3.8	3.74	3.75	3.8
	CO	34.4	36.2	35.3	34.43	32.06	33.2
	CO_2	425.	429.	427.	446.6	443.4	445.
	NO_x	3.82	4.02	3.9	4.30	4.55	4.4
	Fuel	154.9	157.3	156.	161.7	159.6	161.
14	HC	4.67	4.64	4.7	4.70	4.47	4.6
	CO	83.2	85.9	84.6	77.26	82.86	80.1
	CO_2	373.	379.	376.	396.8	394.9	396.
	NO_x	0.93	0.87	0.9	0.92	0.91	0.9
	Fuel	163.7	166.8	165.	168.2	170.2	169.
15	HC	4.23	4.21	4.2	4.05	4.41	4.2
	CO	88.7	82.7	85.7	93.88	86.85	90.4
	CO_2	396.	402.	399.	414.6	424.1	419.
	NO_x	1.46	1.60	1.5	1.83	2.07	2.0
	Fuel	173.2	172.1	173.	181.4	181.3	181.
16	HC	5.49	5.25	5.4	5.52	5.40	5.5
	CO	89.2	85.5	87.3	88.35	90.14	89.2
	CO_2	339.	335.	337.	357.7	350.7	354.
	NO_x	1.55	1.59	1.6	2.12	2.16	2.1
	Fuel	156.7	153.4	155.	162.2	160.7	161.
17	HC	2.97	2.90	2.9	3.11	3.18	3.1
	CO	15.9	14.5	15.2	15.95	17.1	16.5
	CO_2	356	340	348	376.4	376.6	376
	NO_x	1.45	1.32	1.4	1.52	1.35	1.4
	Fuel	123.3	117.4	120.	129.8	130.5	130.
18	HC	3.30	3.64	3.5	2.97	3.29	3.1
	CO	10.6	11.3	11.0	7.72	9.55	8.6
	CO_2	422.	433.	428.	433.	425.6	429.
	NO_x	1.72	1.72	1.7	1.82	1.81	1.8
	Fuel	141.7	145.8	144.	143.4	142.3	143.

APPENDIX C-21

TABLE 01. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 01 TEST 1 3- 7-75 DODGE D2 GAS 1970 5,2 LITRE V8 GVW 2484 KG HUM = 12,3 G/KG

MODE	CONCENTRATION CORRECTED HC	CO	CO2	NOX	CALCULATED GRAMS/MINUTE HC	CO	CO2	NO2	FUEL	WT, FACT,	WEIGHTED GRAMS/MINUTE HC	CO	CO2	NO2	FUEL
1 IDLE	83	639	,21	1	,88	13,8	73,0	,02	30,75	,232	,21	3,2	17	,00	7,1
2 16 HG	94	33	1,13	84	1,00	,7	383,7	3,12	122,42	,077	,08	,1	30	,24	9,4
3 10 HG	122	138	1,77	274	1,30	3,0	602,8	10,21	192,97	,147	,19	,4	89	1,50	28,4
4 16 HG	69	33	1,13	84	,73	,7	383,7	3,12	122,15	,077	,06	,1	30	,24	9,4
5 19 HG	9	2	,86	1	,09	,0	294,2	,02	92,92	,057	,01	,0	17	,00	5,3
6 16 HG	66	193	1,13	84	,71	4,1	383,7	3,12	123,83	,077	,05	,3	30	,24	9,5
7 3 HG	539	9534	2,55	119	5,75	205,3	868,2	4,44	381,47	,113	,65	23,2	98	,50	43,1
8 16 HG	79	192	1,17	89	,84	4,1	398,1	3,31	128,51	,077	,06	,3	31	,25	9,9
9 C,T,	1310	1045	,11	1	13,98	22,5	36,2	,02	36,55	,143	2,00	3,2	5	,00	5,2
----CYCLE COMPOSITE IN GRAMS/MINUTE----											3,30	30,0	345	2,99	127,4
1 IDLE	108	1831	,22	1	1,15	39,4	73,2	,02	43,80	,232	,27	9,1	17	,00	10,2
2 16 HG	94	246	1,15	79	1,00	5,3	390,9	2,93	126,97	,077	,08	,4	30	,23	9,8
3 10 HG	132	297	1,82	279	1,41	6,4	620,0	10,40	200,21	,147	,21	,9	91	1,53	29,4
4 16 HG	71	139	1,15	89	,76	3,0	390,9	3,31	125,58	,077	,06	,2	30	,25	9,7
5 19 HG	14	2	,86	1	,14	,0	294,2	,02	92,97	,057	,01	,0	17	,00	5,3
6 16 HG	69	86	1,15	94	,73	1,9	390,9	3,44	124,99	,077	,06	,1	30	,27	9,6
7 3 HG	539	9745	2,58	119	5,75	209,9	878,7	4,44	387,02	,113	,65	23,7	99	,50	43,7
8 16 HG	81	246	1,17	99	,87	5,3	398,1	3,68	129,11	,077	,07	,4	31	,28	9,9
9 C,T,	1310	1163	,11	1	13,98	25,0	36,2	,02	37,82	,143	2,00	3,6	5	,00	5,4
----CYCLE COMPOSITE IN GRAMS/MINUTE----											3,39	38,6	350	3,07	133,0
1 IDLE	103	1706	,22	1	1,10	36,7	73,2	,02	42,41	,232	,25	8,5	17	,00	9,8
2 16 HG	99	139	1,17	89	1,05	3,0	398,1	3,31	128,16	,077	,08	,2	31	,25	9,9
3 10 HG	125	350	1,80	294	1,33	7,5	611,4	10,96	197,98	,147	,20	1,1	90	1,61	29,1
4 16 HG	69	246	1,13	89	,73	5,3	383,7	3,31	124,44	,077	,06	,4	30	,25	9,6
5 19 HG	11	33	,86	1	,12	,7	294,2	,02	93,29	,057	,01	,0	17	,00	5,3
6 16 HG	69	192	1,15	94	,73	4,1	390,9	3,49	126,13	,077	,06	,3	30	,27	9,7
7 3 HG	539	9751	2,55	114	5,75	210,0	868,2	4,25	383,80	,113	,65	23,7	98	,48	43,4
8 16 HG	79	246	1,19	99	,84	5,3	405,4	3,68	131,38	,077	,06	,4	31	,28	10,1
9 C,T,	1335	1163	,11	1	14,24	25,0	36,2	,02	38,09	,143	2,04	3,6	5	,00	5,4
----CYCLE COMPOSITE IN GRAMS/MINUTE----											3,40	38,3	348	3,16	132,4
1 IDLE	108	1894	,22	1	1,15	40,8	73,2	,02	44,48	,232	,27	9,5	17	,00	10,3
2 16 HG	96	192	1,15	84	1,03	4,1	390,9	3,12	126,42	,077	,08	,3	30	,24	9,7
3 10 HG	135	244	1,82	299	1,44	5,2	620,0	11,14	199,67	,147	,21	,8	91	1,64	29,4
4 16 HG	69	86	1,15	89	,73	1,9	390,9	3,31	124,99	,077	,06	,1	30	,25	9,6
5 19 HG	14	23	,86	1	,14	,5	294,2	,02	93,20	,057	,01	,0	17	,00	5,3
6 16 HG	66	139	1,15	84	,71	3,0	390,9	3,12	125,53	,077	,05	,2	30	,24	9,7
7 3 HG	539	9860	2,55	109	5,75	212,3	868,2	4,06	384,97	,113	,65	24,0	98	,46	43,5
8 16 HG	81	246	1,19	104	,87	5,3	405,4	3,87	131,41	,077	,07	,4	31	,30	10,1
9 C,T,	1285	1222	,11	1	13,71	26,3	36,2	,02	38,19	,143	1,96	3,8	5	,00	5,5
----CYCLE COMPOSITE IN GRAMS/MINUTE----											3,35	39,1	350	3,14	133,1
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)----											3,35	34,7	348	3,03	130,2
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)----											3,38	38,7	349	3,15	132,7

FOUR CYCLE COMPOSITE =

HC= FID 0,35(3,3) + 0,65(3,4) = 3,368 GRAMS/MINUTE
CO= NDIR 0,35(34,7) + 0,65(38,7) = 37,317 GRAMS/MINUTE
CO2=NDIR 0,35(347,6) + 0,65(349,1) = 348,556 GRAMS/MINUTE
NO2=CL 0,35(3,0) + 0,65(3,2) = 3,108 GRAMS/MINUTE
FUEL 0,35(130,2) + 0,65(132,7) = 131,845 GRAMS/MINUTE
FUEL CONSUMED = 98,620 MILLILITRES/MINUTE

NOT REPRODUCIBLE

APPENDIX C-21

TABLE 02. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 02 TEST 4 3- 7-75 CHEVROLET D2GAS 1974 6,0 LITRE V8 GVW 10433 KG HUM = 8,7 G/KG

	CONCENTRATION CORRECTED				----CALCULATED GRAMS/MINUTE-----					WT.	---WEIGHTED GRAMS/MINUTE---				
MODE	HC	CO	CO2	NOX	HC	CO	CO2	NO2	FUEL	FACT.	HC	CO	CO2	NO2	FUEL
1 IDLE	224	2699	,36	0	2,35	57,0	120,8	,00	68,74	,232	,54	13,2	28	,00	15,9
2 16 HG	161	2517	1,32	18	1,69	53,2	441,9	,59	167,49	,077	,13	4,1	34	,05	12,9
3 10 HG	288	2154	2,23	218	3,02	45,5	743,1	7,10	260,04	,147	,44	6,7	109	1,04	38,2
4 16 HG	144	2256	1,35	23	1,50	47,7	449,3	,76	166,91	,077	,12	3,7	35	,06	12,9
5 19 HG	53	1339	,96	0	,55	28,3	321,9	,01	116,13	,057	,03	1,6	18	,00	6,6
6 16 HG	134	2065	1,32	23	1,40	43,6	441,9	,76	162,45	,077	,11	3,4	34	,06	12,5
7 3 HG	553	4050	3,17	504	5,79	85,6	1059,5	16,38	382,52	,113	,65	9,7	120	1,85	43,2
8 16 HG	149	2193	1,32	28	1,56	46,3	441,9	,92	163,95	,077	,12	3,6	34	,07	12,6
9 C.T.	1072	2366	,35	0	11,22	50,0	115,4	,00	72,40	,143	1,60	7,1	16	,00	10,4
---------------CYCLE COMPOSITE IN GRAMS/MINUTE---------------											3,75	53,1	428	3,13	165,3
1 IDLE	202	2766	,38	0	2,11	58,4	126,4	,00	70,97	,232	,49	13,6	29	,00	16,5
2 16 HG	171	2582	1,32	18	1,79	54,6	441,9	,59	168,29	,077	,14	4,2	34	,05	13,0
3 10 HG	288	2091	2,23	238	3,02	44,2	743,1	7,75	259,38	,147	,44	6,5	109	1,14	38,1
4 16 HG	141	2256	1,35	23	1,48	47,7	449,3	,76	166,88	,077	,11	3,7	35	,06	12,9
5 19 HG	53	1278	,98	0	,55	27,0	328,6	,01	117,62	,057	,03	1,5	19	,00	6,7
6 16 HG	144	2125	1,41	28	1,51	44,9	471,9	,92	172,60	,077	,12	3,5	36	,07	13,3
7 3 HG	528	4336	3,25	499	5,53	91,6	1083,3	16,21	392,76	,113	,63	10,4	122	1,83	44,4
8 16 HG	149	2382	1,41	23	1,56	50,3	472,0	,76	175,43	,077	,12	3,9	36	,06	13,5
9 C.T.	1372	2770	,30	0	14,36	58,5	99,0	,00	74,62	,143	2,05	8,4	14	,00	10,7
---------------CYCLE COMPOSITE IN GRAMS/MINUTE---------------											4,13	55,5	435	3,21	169,0
1 IDLE	229	2699	,36	0	2,40	57,0	120,8	,00	68,79	,232	,56	13,2	28	,00	16,0
2 16 HG	161	2512	1,41	18	1,69	53,1	472,0	,59	176,94	,077	,13	4,1	36	,05	13,6
3 10 HG	291	2152	2,28	233	3,04	45,5	762,0	7,59	266,03	,147	,45	6,7	112	1,12	39,1
4 16 HG	146	2126	1,39	23	1,53	44,9	464,3	,76	170,32	,077	,12	3,5	36	,06	13,1
5 19 HG	58	1397	1,00	0	,60	29,5	335,3	,01	121,05	,057	,03	1,7	19	,00	6,9
6 16 HG	136	2062	1,41	23	1,43	43,6	471,9	,76	171,93	,077	,11	3,4	36	,06	13,2
7 3 HG	553	4281	3,04	509	5,79	90,5	1013,1	16,54	370,31	,113	,65	10,2	114	1,87	41,8
8 16 HG	156	2383	1,39	23	1,64	50,4	464,4	,76	173,13	,077	,13	3,9	36	,06	13,3
9 C.T.	1472	2043	,28	0	15,40	43,2	93,5	,00	66,31	,143	2,20	6,2	13	,00	9,5
---------------CYCLE COMPOSITE IN GRAMS/MINUTE---------------											4,38	52,8	431	3,21	166,6
1 IDLE	249	2565	,35	0	2,61	54,2	115,3	,00	65,85	,232	,60	12,6	27	,00	15,3
2 16 HG	164	2382	1,41	18	1,72	50,3	472,0	,59	175,59	,077	,13	3,9	36	,05	13,5
3 10 HG	293	2150	2,31	233	3,07	45,4	771,6	7,59	269,07	,147	,45	6,7	113	1,12	39,6
4 16 HG	146	2254	1,39	23	1,53	47,6	464,4	,76	171,66	,077	,12	3,7	36	,06	13,2
5 19 HG	53	1337	1,00	0	,55	28,3	335,3	,01	120,37	,057	,03	1,6	19	,00	6,9
6 16 HG	141	2125	1,41	23	1,48	44,9	471,9	,76	172,65	,077	,11	3,5	36	,06	13,3
7 3 HG	554	4173	3,43	514	5,80	88,2	1144,3	16,70	410,58	,113	,66	10,0	129	1,89	46,4
8 16 HG	154	2317	1,41	23	1,61	49,0	472,0	,76	174,80	,077	,12	3,8	36	,06	13,5
9 C.T.	1222	2301	,33	0	12,79	48,6	109,9	,00	71,55	,143	1,83	7,0	16	,00	10,2
---------------CYCLE COMPOSITE IN GRAMS/MINUTE---------------											4,06	52,6	449	3,23	171,8
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)---											3,94	54,3	432	3,17	167,1
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)---											4,22	52,7	440	3,22	169,2

FOUR CYCLE COMPOSITE =

HC= FID	0,35(	3,9) + 0,65(	4,2) =	4,122	GRAMS/MINUTE
CO= NDIR	0,35(	54,3) + 0,65(	52,7) =	53,236	GRAMS/MINUTE
CO2=NDIR	0,35(	431,8) + 0,65(	440,1) =	437,237	GRAMS/MINUTE
NO2=CL	0,35(	3,2) + 0,65(	3,2) =	3,199	GRAMS/MINUTE
FUEL	0,35(	167,1) + 0,65(	169,2) =	168,471	GRAMS/MINUTE

FUEL CONSUMED = 126,016 MILLILITRES/MINUTE

APPENDIX C-21

TABLE 03. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 03 TEST 2 3- 6-75 FORD D2GAS 1973 5,9 LITRE V8 GVW 10433 KG HUM = 11,0 G/KG

MODE	CONCENTRATION CORRECTED HC	CO	CO2	NOX	----CALCULATED GRAMS/MINUTE----- HC	CO	CO2	NO2	FUEL	WT. FACT.	---WEIGHTED GRAMS/MINUTE--- HC	CO	CO2	NO2	FUEL
1 IDLE	96	1414	,23	1	1,01	30,0	77,5	,02	40,34	,232	,23	7,0	18	,00	9,4
2 16 HG	143	1092	1,28	63	1,50	23,2	429,0	2,21	148,35	,077	,12	1,8	33	,17	11,4
3 10 HG	272	1134	2,03	333	2,86	24,1	681,7	11,71	229,89	,147	,42	3,5	100	1,72	33,8
4 16 HG	125	1092	1,26	68	1,32	23,2	421,6	2,38	145,85	,077	,10	1,8	32	,18	11,2
5 19 HG	47	363	,92	13	,49	7,7	309,9	,45	102,08	,057	,03	,4	18	,03	5,8
6 16 HG	128	1092	1,26	68	1,34	23,2	421,6	2,38	145,87	,077	,10	1,8	32	,18	11,2
7 3 HG	188	617	2,93	528	1,98	13,1	983,3	18,58	318,74	,113	,22	1,5	111	2,10	36,0
8 16 HG	118	1091	1,30	78	1,24	23,2	436,4	2,74	150,41	,077	,10	1,8	34	,21	11,6
9 C.T.	1151	649	,23	1	12,10	13,8	77,5	,02	43,39	,143	1,73	2,0	11	,00	6,2
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3,05	21,5	390	4,60	136,7
1 IDLE	111	1414	,23	1	1,17	30,0	77,5	,02	40,50	,232	,27	7,0	18	,00	9,4
2 16 HG	145	1034	1,28	68	1,53	22,0	429,0	2,38	147,76	,077	,12	1,7	33	,18	11,4
3 10 HG	282	1308	2,01	328	2,96	27,8	672,8	11,54	229,01	,147	,44	4,1	99	1,70	33,7
4 16 HG	128	976	1,28	78	1,34	20,7	429,0	2,74	146,96	,077	,10	1,6	33	,21	11,3
5 19 HG	59	417	,96	18	,63	8,9	323,3	,62	107,01	,057	,04	,5	18	,04	6,1
6 16 HG	123	976	1,28	73	1,29	20,7	429,0	2,56	146,91	,077	,10	1,6	33	,20	11,3
7 3 HG	181	617	2,93	548	1,90	13,1	963,3	19,28	318,66	,113	,21	1,5	111	2,18	36,0
8 16 HG	115	1033	1,30	83	1,21	21,9	436,4	2,91	149,77	,077	,09	1,7	34	,22	11,5
9 C.T.	1176	706	,23	1	12,37	15,0	77,5	,02	44,26	,143	1,77	2,1	11	,00	6,3
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3,14	21,8	390	4,73	137,0
1 IDLE	113	1475	,23	1	1,19	31,3	77,5	,02	41,17	,232	,28	7,3	18	,00	9,6
2 16 HG	145	1092	1,28	68	1,53	23,2	429,0	2,38	148,37	,077	,12	1,8	33	,18	11,4
3 10 HG	272	1135	1,98	328	2,86	24,1	663,8	11,53	224,25	,147	,42	3,5	98	1,70	33,0
4 16 HG	123	976	1,28	73	1,29	20,7	429,0	2,56	146,91	,077	,10	1,6	33	,20	11,3
5 19 HG	59	473	,92	13	,63	10,0	309,9	,45	103,38	,057	,04	,6	18	,03	5,9
6 16 HG	133	1092	1,28	73	1,40	23,2	429,0	2,56	148,24	,077	,11	1,8	33	,20	11,4
7 3 HG	196	563	2,93	558	2,06	12,0	983,3	19,63	318,25	,113	,23	1,4	111	2,22	36,0
8 16 HG	125	1034	1,28	78	1,32	22,0	429,0	2,74	147,55	,077	,10	1,7	33	,21	11,4
9 C.T.	1176	649	,23	1	12,37	13,8	77,5	,02	43,65	,143	1,77	2,0	11	,00	6,2
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3,16	21,6	388	4,74	136,1
1 IDLE	133	1537	,23	1	1,40	32,6	77,5	,02	42,03	,232	,33	7,6	18	,00	9,8
2 16 HG	155	1092	1,28	68	1,63	23,2	429,0	2,38	148,48	,077	,13	1,8	33	,18	11,4
3 10 HG	287	1425	2,03	328	3,02	30,3	681,8	11,54	233,13	,147	,44	4,4	100	1,70	34,3
4 16 HG	133	1034	1,26	73	1,40	22,0	421,6	2,56	145,31	,077	,11	1,7	32	,20	11,2
5 19 HG	72	584	,92	13	,76	12,4	309,9	,45	104,69	,057	,04	,7	18	,03	6,0
6 16 HG	130	1034	1,28	68	1,37	22,0	429,0	2,38	147,60	,077	,11	1,7	33	,18	11,4
7 3 HG	186	563	2,90	578	1,95	12,0	972,2	20,33	314,62	,113	,22	1,4	110	2,30	35,6
8 16 HG	125	1092	1,26	78	1,32	23,2	421,6	2,74	145,85	,077	,10	1,8	32	,21	11,2
9 C.T.	1126	763	,23	1	11,84	16,2	77,5	,02	44,34	,143	1,69	2,3	11	,00	6,3
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3,17	23,3	388	4,80	137,1
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)											3,10	21,6	390	4,67	136,8
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)											3,16	22,5	388	4,77	136,6

FOUR CYCLE COMPOSITE =

HC= FID 0,35(3,1) + 0,65(3,2) = 3,139 GRAMS/MINUTE
CO= NDIR 0,35(21,6) + 0,65(22,5) = 22,170 GRAMS/MINUTE
CO2=NDIR 0,35(389,9) + 0,65(387,7) = 388,453 GRAMS/MINUTE
NO2=CL 0,35(4,7) + 0,65(4,8) = 4,733 GRAMS/MINUTE
FUEL 0,35(136,8) + 0,65(136,6) = 136,695 GRAMS/MINUTE
FUEL CONSUMED = 102,248 MILLILITRES/MINUTE

NOT REPRODUCIBLE

APPENDIX C-21

TABLE 04. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 04 TEST 1 3- 6-75 IHC D2GAS 1975 5,7 LITRE V8 GVW 10206 KG HUM = 11,4 G/KG

MODE	CONCENTRATION CORRECTED HC	CO	CO2	NOX	CALCULATED GRAMS/MINUTE HC	CO	CO2	NO2	FUEL	WT, FACT,	WEIGHTED GRAMS/MINUTE HC	CO	CO2	NO2	FUEL
1 IDLE	236	195	,24	1	2,52	4,2	82,7	,02	30,70	,232	,59	1,0	19	,01	7,1
2 16 HG	179	910	1,22	38	1,92	19,6	414,8	1,37	142,52	,077	,15	1,5	32	,11	11,0
3 10 HG	346	2024	1,83	178	3,70	43,7	624,4	6,45	222,36	,147	,54	6,4	92	,95	32,7
4 16 HG	164	854	1,22	43	1,75	18,4	414,7	1,55	141,74	,077	,14	1,4	32	,12	10,9
5 19 HG	81	465	,94	33	,86	10,0	322,1	1,19	107,46	,057	,05	,6	18	,07	6,1
6 16 HG	152	910	1,22	43	1,62	19,6	414,7	1,55	142,22	,077	,12	1,5	32	,12	11,0
7 3 HG	596	9236	2,54	178	6,37	199,3	864,8	6,46	378,04	,113	,72	22,5	98	,73	42,7
8 16 HG	174	967	1,24	48	1,86	20,9	422,2	1,74	145,42	,077	,14	1,6	33	,13	11,2
9 C,T,	312	249	,57	1	3,34	5,4	192,8	,03	66,82	,143	,48	,8	28	,00	9,6
CYCLE COMPOSITE IN GRAMS/MINUTE											2,93	37,3	383	2,23	142,2
1 IDLE	251	250	,24	1	2,68	5,4	82,7	,02	31,44	,232	,62	1,3	19	,01	7,3
2 16 HG	182	968	1,20	38	1,94	20,9	407,4	1,37	140,83	,077	,15	1,6	31	,11	10,8
3 10 HG	349	2023	1,86	178	3,73	43,7	633,2	6,45	225,15	,147	,55	6,4	93	,96	33,1
4 16 HG	167	854	1,22	43	1,78	18,4	414,7	1,55	141,77	,077	,14	1,4	32	,12	10,9
5 19 HG	83	521	,92	33	,89	11,2	315,2	1,19	105,93	,057	,05	,6	18	,07	6,0
6 16 HG	157	910	1,22	43	1,67	19,6	414,7	1,55	142,28	,077	,13	1,5	32	,12	11,0
7 3 HG	471	8107	2,60	168	5,03	174,9	885,6	6,10	371,17	,113	,57	19,8	100	,69	41,9
8 16 HG	172	910	1,22	48	1,84	19,6	414,8	1,74	142,44	,077	,14	1,5	32	,13	11,0
9 C,T,	312	249	,55	1	3,34	5,4	186,7	,03	64,90	,143	,48	,8	27	,00	9,3
CYCLE COMPOSITE IN GRAMS/MINUTE											2,82	34,9	384	2,19	141,3
1 IDLE	236	250	,24	1	2,52	5,4	82,7	,02	31,28	,232	,59	1,3	19	,01	7,3
2 16 HG	184	968	1,22	38	1,97	20,9	414,8	1,37	143,19	,077	,15	1,6	32	,11	11,0
3 10 HG	357	2148	1,86	178	3,81	46,3	633,2	6,45	226,58	,147	,56	6,8	93	,95	33,3
4 16 HG	172	910	1,22	43	1,84	19,6	414,8	1,55	142,44	,077	,14	1,5	32	,12	11,0
5 19 HG	86	521	,95	33	,92	11,2	322,1	1,19	108,11	,057	,05	,6	18	,07	6,2
6 16 HG	162	910	1,22	43	1,73	19,6	414,7	1,55	142,33	,077	,13	1,5	32	,12	11,0
7 3 HG	571	8304	2,60	168	6,10	179,2	885,6	6,10	374,37	,113	,69	20,2	100	,69	42,3
8 16 HG	174	1025	1,22	48	1,86	22,1	414,8	1,74	143,70	,077	,14	1,7	32	,13	11,1
9 C,T,	337	249	,55	1	3,60	5,4	186,7	,03	65,17	,143	,52	,8	27	,00	9,3
CYCLE COMPOSITE IN GRAMS/MINUTE											2,97	36,1	385	2,19	142,4
1 IDLE	256	195	,24	1	2,74	4,2	82,7	,02	30,91	,232	,64	1,0	19	,01	7,2
2 16 HG	187	910	1,22	38	2,00	19,6	414,8	1,37	142,60	,077	,15	1,5	32	,11	11,0
3 10 HG	359	2086	1,83	183	3,84	45,0	624,4	6,63	223,17	,147	,56	6,6	92	,98	32,8
4 16 HG	174	910	1,22	48	1,86	19,6	414,8	1,74	142,46	,077	,14	1,5	32	,13	11,0
5 19 HG	86	576	,95	33	,92	12,4	322,1	1,19	108,70	,057	,05	,7	18	,07	6,2
6 16 HG	167	968	1,20	48	1,78	20,9	407,4	1,73	140,67	,077	,14	1,6	31	,13	10,8
7 3 HG	545	7160	2,60	203	5,83	154,5	885,4	7,37	361,78	,113	,66	17,5	100	,83	40,9
8 16 HG	174	968	1,22	53	1,86	20,9	414,6	1,92	143,08	,077	,14	1,6	32	,15	11,0
9 C,T,	362	249	,55	1	3,87	5,4	186,7	,03	65,44	,143	,55	,8	27	,00	9,4
CYCLE COMPOSITE IN GRAMS/MINUTE											3,04	32,8	383	2,41	140,2
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)											2,88	36,1	384	2,21	141,8
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)											3,01	34,4	384	2,30	141,3

FOUR CYCLE COMPOSITE -

HC- FID 0,35(2,9) + 0,65(3,0) = 2,960 GRAMS/MINUTE

CO- NDIR 0,35(36,1) + 0,65(34,4) = 35,006 GRAMS/MINUTE

CO2-NDIR 0,35(383,5) + 0,65(384,2) = 383,967 GRAMS/MINUTE

NO2-CL 0,35(2,2) + 0,65(2,3) = 2,270 GRAMS/MINUTE

FUEL 0,35(141,8) + 0,65(141,3) = 141,465 GRAMS/MINUTE

FUEL CONSUMED = 105,816 MILLILITRES/MINUTE

APPENDIX C-21

TABLE 05. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 05 TEST 1 3-31-75 CHEVROLET D2GAS 1965 4,8 LITRE I6 GVW 8845 KG HUM = 9,4 G/KG

MODE	CONCENTRATION CORRECTED HC	CO	CO2	NOX	CALCULATED GRAMS/MINUTE HC	CO	CO2	NO2	FUEL	WT. FACT.	WEIGHTED GRAMS/MINUTE HC	CO	CO2	NO2	FUEL
1 IDLE	213	82	,20	0	2,28	1,8	67,6	,00	24,49	,232	,53	,4	16	,00	5,7
2 16 HG	263	407	1,02	69	2,81	8,8	348,6	2,36	117,15	,077	,22	,7	27	,18	9,0
3 10 HG	125	677	1,67	195	1,34	14,6	569,2	6,62	188,18	,147	,20	2,1	84	,97	27,7
4 16 HG	278	352	1,05	60	2,97	7,6	355,6	2,03	118,92	,077	,23	,6	27	,16	9,2
5 19 HG	373	520	,73	17	3,98	11,2	248,9	,57	88,06	,057	,23	,6	14	,03	5,0
6 16 HG	264	428	1,07	55	2,81	9,2	362,6	1,86	121,79	,077	,22	,7	28	,14	9,4
7 3 HG	392	12177	2,04	60	4,19	262,3	693,2	2,03	352,95	,113	,47	29,6	78	,23	39,9
8 16 HG	239	407	1,07	71	2,55	8,8	362,6	2,41	121,29	,077	,20	,7	28	,19	9,3
9 C.T.	411	242	,18	0	4,38	5,2	62,3	,00	26,63	,143	,63	,7	9	,00	3,8
CYCLE COMPOSITE IN GRAMS/MINUTE											2,91	36,2	311	1,90	118,9
1 IDLE	266	187	,20	0	2,84	4,0	67,6	,00	26,18	,232	,66	,9	16	,00	6,1
2 16 HG	239	511	1,07	67	2,55	11,0	362,6	2,29	122,41	,077	,20	,8	28	,18	9,4
3 10 HG	120	728	1,70	200	1,29	15,7	577,6	6,79	191,31	,147	,19	2,3	85	1,00	28,1
4 16 HG	239	374	1,07	74	2,55	8,1	362,6	2,51	120,94	,077	,20	,6	28	,19	9,3
5 19 HG	338	542	,73	17	3,60	11,7	248,9	,57	87,92	,057	,21	,7	14	,03	5,0
6 16 HG	243	429	1,05	70	2,60	9,2	355,6	2,37	119,37	,077	,20	,7	27	,18	9,2
7 3 HG	395	12298	2,06	55	4,22	264,9	702,4	1,86	357,17	,113	,48	29,9	79	,21	40,4
8 16 HG	214	407	1,09	72	2,28	8,8	369,6	2,44	123,26	,077	,18	,7	28	,19	9,5
9 C.T.	421	242	,17	0	4,49	5,2	57,0	,00	25,06	,143	,64	,7	8	,00	3,6
CYCLE COMPOSITE IN GRAMS/MINUTE											2,94	37,4	314	1,98	120,6
1 IDLE	241	187	,20	0	2,57	4,0	67,6	,00	26,91	,232	,60	,9	16	,00	6,0
2 16 HG	264	428	1,07	68	2,81	9,2	362,6	2,31	121,79	,077	,22	,7	28	,18	9,4
3 10 HG	120	672	1,70	210	1,29	14,5	577,6	7,13	190,70	,147	,19	2,1	85	1,05	28,0
4 16 HG	189	428	1,07	65	2,01	9,2	362,6	2,20	120,99	,077	,15	,7	28	,17	9,3
5 19 HG	388	570	,73	16	4,14	12,3	248,9	,54	88,76	,057	,24	,7	14	,03	5,1
6 16 HG	224	483	1,07	71	2,39	10,4	362,6	2,42	121,95	,077	,18	,8	28	,19	9,4
7 3 HG	405	12564	2,04	55	4,32	270,6	693,3	1,86	357,24	,113	,49	30,6	78	,21	40,4
8 16 HG	239	456	1,09	77	2,55	9,8	369,6	2,61	124,04	,077	,20	,8	28	,20	9,6
9 C.T.	401	215	,18	0	4,28	4,6	62,3	,00	26,23	,143	,61	,7	9	,00	3,8
CYCLE COMPOSITE IN GRAMS/MINUTE											2,87	38,0	314	2,03	120,9
1 IDLE	276	215	,18	0	2,94	4,6	62,3	,00	24,89	,232	,68	1,1	14	,00	5,8
2 16 HG	263	484	1,02	70	2,81	10,4	348,6	2,37	117,97	,077	,22	,8	27	,18	9,1
3 10 HG	123	842	1,65	205	1,31	18,1	561,0	6,96	187,30	,147	,19	2,7	82	1,02	27,5
4 16 HG	214	456	1,07	65	2,28	9,8	362,6	2,20	121,55	,077	,18	,8	28	,17	9,4
5 19 HG	388	570	,73	10	4,14	12,3	248,9	,34	88,76	,057	,24	,7	14	,02	5,1
6 16 HG	313	401	1,02	55	3,34	8,6	348,6	1,86	117,62	,077	,26	,7	27	,14	9,1
7 3 HG	397	12318	1,98	53	4,24	265,3	675,1	1,80	348,78	,113	,48	30,0	76	,20	39,4
8 16 HG	214	401	1,09	76	2,28	8,6	369,6	2,58	123,19	,077	,18	,7	28	,20	9,5
9 C.T.	401	242	,20	0	4,28	5,2	67,7	,00	28,21	,143	,61	,7	10	,00	4,0
CYCLE COMPOSITE IN GRAMS/MINUTE											3,03	38,1	307	1,94	118,8
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)											2,92	36,8	312	1,94	119,8
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)											2,95	38,0	311	1,98	119,8

FOUR CYCLE COMPOSITE =

HC= FID 0,35(2,9) + 0,65(2,9) = 2,941 GRAMS/MINUTE
CO= NDIR 0,35(36,8) + 0,65(38,0) = 37,504 GRAMS/MINUTE
CO2=NDIR 0,35(312,4) + 0,65(310,7) = 311,300 GRAMS/MINUTE
NO2=CL 0,35(1,9) + 0,65(2,0) = 1,969 GRAMS/MINUTE
FUEL 0,35(119,8) + 0,65(119,8) = 119,805 GRAMS/MINUTE
FUEL CONSUMED = 89,614 MILLILITRES/MINUTE

NOT REPRODUCIBLE

APPENDIX C-21

TABLE 06. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 06 TEST 1 4- 1-75 FORD D2GAS 1974 6,4 LITRE V8 GVW 10505 KG HUM = 9,0 G/KG

MODE	CONCENTRATION CORRECTED HC	CO	CO2	NOX	----CALCULATED GRAMS/MINUTE----- HC	CO	CO2	NO2	FUEL	WT. FACT.	---WEIGHTED GRAMS/MINUTE--- HC	CO	CO2	NO2	FUEL
1 IDLE	762	216	,33	0	7,94	4,5	108,9	,02	44,56	,232	1,84	1,1	25	,00	10,3
2 16 HG	218	765	1,39	95	2,27	16,1	461,8	3,11	155,96	,077	,17	1,2	36	,24	12,0
3 10 HG	279	1130	2,17	285	2,91	23,8	720,6	9,33	242,03	,147	,43	3,5	106	1,37	35,6
4 16 HG	143	794	1,39	100	1,48	16,7	461,8	3,27	155,48	,077	,11	1,3	36	,25	12,0
5 19 HG	53	377	1,05	30	,55	7,9	347,1	1,00	113,99	,057	,03	,5	20	,06	6,5
6 16 HG	138	851	1,41	100	1,43	17,9	469,4	3,27	158,41	,077	,11	1,4	36	,25	12,2
7 3 HG	578	5847	3,07	390	6,02	123,0	1019,7	12,77	388,71	,113	,68	13,9	115	1,44	43,9
8 16 HG	165	996	1,41	95	1,72	21,0	469,4	3,11	160,22	,077	,13	1,6	36	,24	12,3
9 C.T.	1338	409	,30	0	13,93	8,6	98,2	,01	49,17	,143	1,99	1,2	14	,00	7,0
---CYCLE COMPOSITE IN GRAMS/MINUTE---											5,51	25,6	424	3,86	151,9
1 IDLE	638	325	,38	0	6,64	6,8	125,5	,02	49,62	,232	1,54	1,6	29	,00	11,5
2 16 HG	243	996	1,46	105	2,53	20,9	484,7	3,44	165,83	,077	,19	1,6	37	,26	12,8
3 10 HG	314	1277	2,23	315	3,27	26,8	739,2	10,31	249,82	,147	,48	3,9	109	1,52	36,7
4 16 HG	168	967	1,44	115	1,75	20,3	477,0	3,76	162,33	,077	,13	1,6	37	,29	12,5
5 19 HG	63	459	1,09	35	,66	9,7	360,8	1,15	119,29	,057	,04	,6	21	,07	6,8
6 16 HG	165	996	1,46	115	1,72	20,9	484,7	3,76	165,02	,077	,13	1,6	37	,29	12,7
7 3 HG	604	6090	3,11	415	6,29	128,1	1031,2	13,58	395,14	,113	,71	14,5	117	1,54	44,7
8 16 HG	193	1084	1,46	115	2,01	22,8	484,7	3,76	166,24	,077	,15	1,8	37	,29	12,8
9 C.T.	1338	409	,31	0	13,93	8,6	103,6	,01	50,88	,143	1,99	1,2	15	,00	7,3
---CYCLE COMPOSITE IN GRAMS/MINUTE---											5,38	28,3	438	4,25	157,7
1 IDLE	588	353	,38	0	6,12	7,4	125,5	,02	49,38	,232	1,42	1,7	29	,00	11,5
2 16 HG	218	1025	1,44	110	2,27	21,6	477,0	3,60	163,47	,077	,17	1,7	37	,28	12,6
3 10 HG	316	1344	1,95	325	3,29	28,3	648,6	10,64	221,95	,147	,48	4,2	95	1,56	32,6
4 16 HG	173	996	1,41	120	1,80	21,0	469,4	3,93	160,30	,077	,14	1,6	36	,30	12,3
5 1' HG	76	487	1,09	25	,79	10,2	360,8	,82	119,71	,057	,06	,6	21	,06	6,8
6 1, HG	170	967	1,44	125	1,77	20,3	477,0	4,09	162,36	,077	,14	1,6	37	,32	12,6
7 3 HG	578	5420	3,04	440	6,02	114,0	1008,2	14,40	380,64	,113	,68	12,9	114	1,63	43,0
8 16 HG	180	1115	1,41	120	1,88	23,4	469,4	3,93	161,61	,077	,14	1,8	36	,30	12,4
9 C.T.	1338	381	,30	0	13,93	8,0	98,2	,02	48,88	,143	1,99	1,1	14	,00	7,0
---CYCLE COMPOSITE IN GRAMS/MINUTE---											5,21	27,1	419	4,44	160,8
1 IDLE	663	298	,36	1	6,90	6,3	119,9	,03	47,84	,232	1,60	1,5	28	,01	11,1
2 16 HG	230	1085	1,39	110	2,40	22,8	461,9	3,60	159,45	,077	,18	1,8	36	,28	12,3
3 10 HG	321	1339	2,14	335	3,35	28,2	711,4	10,97	241,76	,147	,49	4,1	105	1,61	35,5
4 16 HG	190	1026	1,41	130	1,98	21,6	469,4	4,26	160,79	,077	,15	1,7	36	,33	12,4
5 19 HG	73	459	1,07	35	,76	9,7	353,9	1,15	117,23	,057	,04	,6	20	,07	6,7
6 16 HG	175	967	1,41	125	1,82	20,3	469,4	4,09	160,02	,077	,14	1,6	36	,32	12,3
7 3 HG	577	4272	3,04	505	6,01	89,8	1008,1	16,53	368,60	,113	,68	10,1	114	1,87	41,7
8 16 HG	193	1115	1,41	130	2,01	23,4	469,4	4,26	161,74	,077	,15	1,8	36	,33	12,5
9 C.T.	1313	437	,30	0	13,67	9,2	98,2	,01	49,20	,143	1,95	1,3	14	,00	7,0
---CYCLE COMPOSITE IN GRAMS/MINUTE---											5,40	24,4	425	4,80	151,4
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)---											5,44	27,0	431	4,06	154,8
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)---											5,31	25,8	422	4,62	151,1

FOUR CYCLE COMPOSITE =

HC= FID 0,35(5,4) + 0,65(5,3) = 5,356 GRAMS/MINUTE
CO= NDIR 0,35(27,0) + 0,65(25,8) = 26,186 GRAMS/MINUTE
CO2=NDIR 0,35(431,0) + 0,65(421,6) = 424,915 GRAMS/MINUTE
NO2=CL 0,35(4,1) + 0,65(4,6) = 4,423 GRAMS/MINUTE
FUEL 0,35(154,8) + 0,65(151,1) = 152,408 GRAMS/MINUTE
FUEL CONSUMED = 114,001 MILLILITRES/MINUTE

APPENDIX C-21

TABLE 07. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 07 TEST 2 4-10-75 IHC D2GAS 1974 6,4 LITRE V8 GVW 10732 KG HUM = 10,8 G/KG

MODE	CONCENTRATION CORRECTED HC	CO	CO2	NOX	CALCULATED GRAMS/MINUTE HC	CO	CO2	NO2	FUEL	WT. FACT.	WEIGHTED GRAMS/MINUTE HC	CO	CO2	NO2	FUEL
1 IDLE	159	2337	,25	0	1,66	44,0	82,0	,01	51,84	,232	,38	11,4	19	,00	12,0
2 16 HG	135	1196	1,51	35	1,41	25,1	499,1	1,20	171,32	,077	,11	1,9	38	,09	13,2
3 10 HG	191	1385	2,37	155	1,98	29,1	785,3	5,35	264,17	,147	,29	4,3	115	,79	38,8
4 16 HG	123	1439	1,51	40	1,28	30,2	499,1	1,37	173,73	,077	,10	2,3	38	,11	13,4
5 19 HG	107	1899	1,05	9	1,11	39,8	346,6	,31	130,22	,057	,06	2,3	20	,02	7,4
6 16 HG	123	1532	1,51	38	1,28	32,2	499,1	1,32	174,70	,077	,10	2,5	38	,10	13,5
7 3 HG	596	7464	3,28	300	6,19	156,6	1088,0	10,37	427,12	,113	,70	17,7	123	1,17	48,3
8 16 HG	158	1688	1,55	42	1,64	35,4	514,8	1,46	181,62	,077	,13	2,7	40	,11	14,0
9 C.T.	2159	1445	,17	0	22,44	30,3	55,9	,00	55,12	,143	3,21	4,3	8	,00	7,9
CYCLE COMPOSITE IN GRAMS/MINUTE											5,08	49,4	440	2,39	168,4
1 IDLE	187	2130	,26	1	1,94	44,7	87,3	,03	51,64	,232	,45	10,4	20	,01	12,0
2 16 HG	193	1501	1,51	38	2,01	31,5	499,1	1,32	175,11	,077	,15	2,4	38	,10	13,5
3 10 HG	256	1722	2,43	180	2,66	36,1	804,9	6,21	274,53	,147	,39	5,3	118	,91	40,4
4 16 HG	173	1753	1,51	41	1,80	36,8	499,2	1,42	177,54	,077	,14	2,8	38	,11	13,7
5 19 HG	127	1865	1,09	11	1,32	39,1	360,3	,37	134,39	,057	,08	2,2	21	,02	7,7
6 16 HG	148	1563	1,51	42	1,54	32,8	499,1	1,44	175,29	,077	,12	2,5	38	,11	13,5
7 3 HG	671	7920	3,32	315	6,97	166,2	1100,1	10,89	436,47	,113	,79	18,8	124	1,23	49,3
8 16 HG	178	1817	1,51	42	1,85	38,1	499,2	1,46	178,26	,077	,14	2,9	38	,11	13,7
9 C.T.	2034	1413	,18	0	21,14	29,6	61,1	,01	55,12	,143	3,02	4,2	9	,00	7,9
CYCLE COMPOSITE IN GRAMS/MINUTE											5,28	51,7	446	2,61	171,6
1 IDLE	187	2095	,26	1	1,94	44,0	87,3	,04	51,29	,232	,45	10,2	20	,01	11,9
2 16 HG	258	1256	1,51	33	2,68	26,4	499,1	1,15	173,23	,077	,21	2,0	38	,09	13,3
3 10 HG	304	2076	2,40	185	3,15	43,6	795,1	6,39	275,64	,147	,46	6,4	117	,94	40,5
4 16 HG	178	1848	1,55	43	1,85	38,8	514,8	1,49	183,51	,077	,14	3,0	40	,11	14,1
5 19 HG	129	1767	1,09	11	1,34	37,1	360,3	,38	133,40	,057	,08	2,1	21	,02	7,6
6 16 HG	173	1784	1,55	43	1,80	37,4	514,8	1,47	182,78	,077	,14	2,9	40	,11	14,1
7 3 HG	671	7729	3,32	320	6,97	162,2	1100,1	11,06	434,47	,113	,79	18,3	124	1,25	49,1
8 16 HG	188	1791	1,58	47	1,96	37,6	522,7	1,61	185,50	,077	,15	2,9	40	,12	14,3
9 C.T.	1959	1405	,18	0	20,36	29,5	61,1	,01	54,26	,143	2,91	4,2	9	,00	7,8
CYCLE COMPOSITE IN GRAMS/MINUTE											5,33	52,1	449	2,66	172,7
1 IDLE	184	2062	,26	1	1,91	43,3	87,3	,04	50,91	,232	,44	10,0	20	,01	11,8
2 16 HG	255	1724	1,44	32	2,65	36,2	476,1	1,11	170,82	,077	,20	2,8	37	,09	13,2
3 10 HG	271	1755	2,40	185	2,82	36,8	795,1	6,39	271,94	,147	,41	5,4	117	,94	40,0
4 16 HG	173	1690	1,48	41	1,80	35,5	491,4	1,42	174,44	,077	,14	2,7	38	,11	13,4
5 19 HG	122	1577	1,07	11	1,26	33,1	353,4	,38	129,16	,057	,07	1,9	20	,02	7,4
6 16 HG	166	1658	1,51	43	1,72	34,8	499,2	1,49	176,46	,077	,13	2,7	38	,11	13,6
7 3 HG	645	7273	3,25	335	6,71	152,6	1076,0	11,58	421,89	,113	,76	17,2	122	1,31	47,7
8 16 HG	178	1720	1,53	44	1,85	36,1	506,9	1,53	179,70	,077	,14	2,8	39	,12	13,8
9 C.T.	149	1382	,17	0	1,55	29,0	55,6	,01	33,48	,143	,22	4,1	8	,00	4,8
CYCLE COMPOSITE IN GRAMS/MINUTE											2,53	49,7	439	2,71	165,6
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)											5,18	50,5	443	2,50	170,0
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)											3,93	50,9	444	2,68	169,2

FOUR CYCLE COMPOSITE =

HC- FID 0,35(5,2) + 0,65(3,9) = 4,366 GRAMS/MINUTE
CO- NDIR 0,35(50,5) + 0,65(50,9) = 50,757 GRAMS/MINUTE
CO2-NDIR 0,35(443,0) + 0,65(443,7) = 443,478 GRAMS/MINUTE
NO2-CL 0,35(2,5) + 0,65(2,7) = 2,620 GRAMS/MINUTE
FUEL 0,35(170,0) + 0,65(169,2) = 169,456 GRAMS/MINUTE
FUEL CONSUMED = 126,753 MILLILITRES/MINUTE

NOT REPRODUCIBLE

APPENDIX C-21

TABLE 08. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 08 TEST 2 4-11-75 DODGE D2GAS 1967 5,9 LITRE V8 GVW 10433 KG HUM = 6,0 G/KG

	CONCENTRATION CORRECTED				----CALCULATED GRAMS/MINUTE-----					WT.	---WEIGHTED GRAMS/MINUTE---				
MODE	HC	CO	CO2	NOX	HC	CO	CO2	NO2	FUEL	FACT.	HC	CO	CO2	NO2	FUEL
1 IDLE	627	1203	,17	0	6,78	26,2	57,9	,00	38,07	,232	1,57	6,1	13	,00	8,8
2 16 HG	258	1218	1,17	80	2,79	26,6	403,6	2,49	143,29	,077	,21	2,0	31	,19	11,0
3 10 HG	234	400	1,90	390	2,53	8,7	654,8	12,11	213,48	,147	,37	1,3	96	1,78	31,4
4 16 HG	188	[illegible]35	1,21	70	2,03	31,3	418,4	2,17	149,55	,077	,16	2,4	32	,17	11,5
5 19 HG	166	[illegible]172	,81	3	1,80	47,4	278,4	,09	113,14	,057	,10	2,7	16	,00	6,4
6 16 HG	173	1724	1,17	60	1,87	37,6	403,6	1,86	147,87	,077	,14	2,9	31	,14	11,4
7 3 HG	672	14673	2,32	80	7,26	320,1	798,6	2,48	417,94	,113	,82	36,2	90	,28	47,2
8 16 HG	284	2474	1,17	50	3,06	54,0	403,8	1,55	157,21	,077	,24	4,2	31	,12	12,1
9 C.T.	2803	488	,05	0	30,29	10,6	16,0	,00	40,61	,143	4,33	1,5	2	,00	5,8
---------------CYCLE COMPOSITE IN GRAMS/MINUTE---------											7,95	59,3	344	2,69	145,7
1 IDLE	728	1424	,20	0	7,86	31,1	68,8	,00	44,97	,232	1,82	7,2	16	,00	10,4
2 16 HG	303	1956	1,17	86	3,28	42,7	403,7	2,67	151,80	,077	,25	3,3	31	,21	11,7
3 10 HG	262	400	1,95	430	2,83	8,7	672,9	13,35	219,47	,147	,42	1,3	99	1,96	32,3
4 16 HG	228	2124	1,19	75	2,47	46,3	411,1	2,32	155,14	,077	,19	3,6	32	,18	11,9
5 19 HG	204	2276	,81	2	2,20	49,7	278,5	,06	114,68	,057	,13	2,8	16	,00	6,5
6 16 HG	206	1922	1,17	65	2,22	41,9	403,7	2,01	150,38	,077	,17	3,2	31	,16	11,6
7 3 HG	672	14664	2,35	75	7,26	320,0	808,6	2,33	421,00	,113	,82	36,2	91	,26	47,6
8 16 HG	334	2688	1,19	60	3,61	58,7	411,2	1,86	162,42	,077	,28	4,5	32	,14	12,5
9 C.T.	2653	661	,09	0	28,67	14,4	31,6	,01	45,79	,143	4,10	2,1	5	,00	6,5
---------------CYCLE COMPOSITE IN GRAMS/MINUTE---------											8,18	64,1	352	2,91	151,1
1 IDLE	753	1424	,20	0	8,14	31,1	68,8	,01	45,24	,232	1,89	7,2	16	,00	10,5
2 16 HG	283	1403	1,21	99	3,06	30,6	418,4	3,07	150,25	,077	,24	2,4	32	,24	11,6
3 10 HG	277	483	1,98	450	2,99	10,5	682,0	13,97	223,41	,147	,44	1,5	100	2,05	32,8
4 16 HG	218	1562	1,21	90	2,36	34,1	418,4	2,79	151,26	,077	,18	2,6	32	,21	11,6
5 19 HG	164	1602	,85	3	1,77	35,0	291,6	,09	111,11	,057	,10	2,0	17	,00	6,3
6 16 HG	188	1309	1,24	90	2,03	28,6	425,8	2,79	150,54	,077	,16	2,2	33	,21	11,6
7 3 HG	672	15114	2,35	70	7,27	329,8	808,6	2,17	425,89	,113	,82	37,3	91	,25	48,1
8 16 HG	334	2763	1,17	55	3,61	60,3	403,8	1,70	160,90	,077	,28	4,6	31	,13	12,4
9 C.T.	2853	517	,05	0	30,83	11,3	16,0	,01	41,46	,143	4,41	1,6	2	,00	5,9
---------------CYCLE COMPOSITE IN GRAMS/MINUTE---------											8,51	61,4	355	3,11	150,9
1 IDLE	778	1488	,22	1	8,41	32,5	74,3	,02	47,93	,232	1,95	7,5	17	,00	11,1
2 16 HG	408	2159	1,17	90	4,41	47,1	403,7	2,79	155,16	,077	,34	3,6	31	,21	11,9
3 10 HG	289	483	1,98	445	3,13	10,5	682,0	13,82	223,54	,147	,46	1,5	100	2,03	32,9
4 16 HG	218	1562	1,21	95	2,36	34,1	418,4	2,95	151,26	,077	,18	2,6	32	,23	11,6
5 19 HG	176	1570	,85	3	1,90	34,3	291,6	,09	110,90	,057	,11	2,0	17	,00	6,3
6 16 HG	203	1341	1,21	95	2,19	29,3	418,3	2,95	148,70	,077	,17	2,3	32	,23	11,4
7 3 HG	672	14813	2,35	70	7,26	323,2	808,6	2,17	422,62	,113	,82	36,5	91	,25	47,8
8 16 HG	334	2762	1,19	89	3,61	60,3	411,2	2,76	163,21	,077	,28	4,6	32	,21	12,6
9 C.T.	2828	517	,05	1	30,56	11,3	16,0	,02	41,19	,143	4,37	1,6	2	,00	5,9
---------------CYCLE COMPOSITE IN GRAMS/MINUTE---------											8,68	62,3	355	3,17	151,6
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)---											8,06	61,7	348	2,80	148,4
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)---											8,59	61,9	355	3,14	151,2

FOUR CYCLE COMPOSITE =

HC= FID	0,35(8,1)	+ 0,65(8,6)	=	8,408	GRAMS/MINUTE
CO= NDIR	0,35(61,7)	+ 0,65(61,9)	=	61,820	GRAMS/MINUTE
CO2=NDIR	0,35(347,8)	+ 0,65(354,9)	=	352,411	GRAMS/MINUTE
NO2=CL	0,35(2,8)	+ 0,65(3,1)	=	3,019	GRAMS/MINUTE
FUEL	0,35(148,4)	+ 0,65(151,2)	=	150,248	GRAMS/MINUTE

FUEL CONSUMED = 112,385 MILLILITRES/MINUTE

APPENDIX C-21

TABLE 09. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 09 TEST 2 4-24-75 IHC D3GAS 1971 5,7 LITRE V8 GVW 18144 KG HUM = 10,0 G/KG

MODE	CONCENTRATION CORRECTED HC	CO	CO2	NOX	CALCULATED GRAMS/MINUTE HC	CO	CO2	NO2	FUEL	WT. FACT.	WEIGHTED GRAMS/MINUTE HC	CO	CO2	NO2	FUEL
1 IDLE	46	1758	,24	1	,48	36,6	77,7	,03	43,14	,232	,11	8,5	18	,01	10,0
2 16 HG	152	1019	1,14	79	1,57	21,2	374,1	2,64	130,12	,077	,12	1,6	29	,20	10,0
3 10 HG	238	1096	1,75	289	2,45	22,8	575,2	9,65	195,25	,147	,36	3,4	85	1,42	28,7
4 16 HG	132	1019	1,14	99	1,36	21,2	374,1	3,30	129,92	,077	,11	1,6	29	,25	10,0
5 19 HG	81	1053	,86	24	,84	21,9	283,8	,80	101,26	,057	,05	1,3	16	,05	5,8
6 16 HG	127	989	1,14	94	1,31	20,6	374,1	3,14	129,56	,077	,10	1,6	29	,24	10,0
7 3 HG	311	2514	2,40	304	3,21	52,4	788,4	10,15	277,93	,113	,36	5,9	89	1,15	31,4
8 16 HG	142	1078	1,14	99	1,47	22,5	374,1	3,30	130,64	,077	,11	1,7	29	,25	10,1
9 C.T.	956	1189	,16	0	9,86	24,8	53,4	,01	38,99	,143	1,41	3,5	8	,00	5,6
CYCLE COMPOSITE IN GRAMS/MINUTE											2,73	29,1	331	3,57	121,5
1 IDLE	56	1693	,24	1	,58	35,3	77,7	,03	42,56	,232	,13	8,2	18	,01	9,9
2 16 HG	143	1078	1,16	79	1,47	22,4	381,2	2,64	132,88	,077	,11	1,7	29	,20	10,2
3 10 HG	236	1335	1,77	279	2,44	27,8	583,0	9,32	200,18	,147	,36	4,1	86	1,37	29,4
4 16 HG	128	1078	1,16	99	1,32	22,4	381,2	3,30	132,72	,077	,10	1,7	29	,25	10,2
5 19 HG	79	1205	,84	14	,81	25,1	277,1	,46	100,67	,057	,05	1,4	16	,03	5,7
6 16 HG	128	1078	1,16	94	1,32	22,4	381,2	3,14	132,72	,077	,10	1,7	29	,24	10,2
7 3 HG	861	2480	2,40	299	8,89	51,6	788,5	9,99	283,27	,113	1,00	5,8	89	1,13	32,0
8 16 HG	168	1078	1,16	99	1,73	22,4	381,2	3,30	133,14	,077	,13	1,7	29	,25	10,3
9 C.T.	956	1281	,18	0	9,86	26,7	59,5	,01	41,85	,143	1,41	3,8	9	,00	6,0
CYCLE COMPOSITE IN GRAMS/MINUTE											3,40	30,3	335	3,49	124,0
1 IDLE	59	1758	,24	1	,61	36,6	77,7	,03	43,27	,232	,14	8,5	18	,01	10,0
2 16 HG	148	1108	1,16	84	1,52	23,1	381,2	2,80	133,24	,077	,12	1,8	29	,22	10,3
3 10 HG	241	1397	1,77	279	2,49	29,1	583,0	9,32	200,86	,147	,37	4,3	86	1,37	29,5
4 16 HG	130	1078	1,16	104	1,34	22,4	381,2	3,47	132,75	,077	,10	1,7	29	,27	10,2
5 19 HG	76	1174	,84	14	,78	24,5	277,0	,46	100,32	,057	,04	1,4	16	,03	5,7
6 16 HG	133	1108	1,16	94	1,37	23,1	381,2	3,14	133,09	,077	,11	1,8	29	,24	10,2
7 3 HG	887	2444	2,42	309	9,15	50,9	797,1	10,32	285,88	,113	1,03	5,8	90	1,17	32,3
8 16 HG	168	1137	1,18	109	1,73	23,7	388,4	3,64	136,01	,077	,13	1,8	30	,28	10,5
9 C.T.	931	1312	,18	1	9,61	27,3	59,5	,03	41,92	,143	1,37	3,9	9	,00	6,0
CYCLE COMPOSITE IN GRAMS/MINUTE											3,42	30,9	336	3,58	124,8
1 IDLE	52	1791	,25	1	,53	37,3	83,8	,03	45,46	,232	,12	8,7	19	,01	10,5
2 16 HG	155	1138	1,16	89	1,60	23,7	381,2	2,97	133,63	,077	,12	1,8	29	,23	10,3
3 10 HG	251	1365	1,80	284	2,59	28,4	590,9	9,48	203,13	,147	,38	4,2	87	1,39	29,9
4 16 HG	140	1078	1,16	104	1,45	22,4	381,2	3,47	132,85	,077	,11	1,7	29	,27	10,2
5 19 HG	86	1174	,86	19	,89	24,4	283,8	,63	102,57	,057	,05	1,4	16	,04	5,8
6 16 HG	138	1108	1,16	94	1,42	23,1	381,2	3,14	133,14	,077	,11	1,8	29	,24	10,3
7 3 HG	3660	1795	2,09	264	37,76	37,4	687,9	8,82	273,34	,113	4,27	4,2	78	1,00	30,9
8 16 HG	343	1078	1,16	99	3,54	22,4	381,2	3,30	134,96	,077	,27	1,7	29	,25	10,4
9 C.T.	981	1251	,16	1	10,12	26,0	53,4	,04	39,89	,143	1,45	3,7	8	,01	5,7
CYCLE COMPOSITE IN GRAMS/MINUTE											6,89	29,2	325	3,43	124,0
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)											3,07	29,7	333	3,53	122,7
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)											5,15	30,1	331	3,50	124,4

FOUR CYCLE COMPOSITE =

HC= FID 0,35(3,1) + 0,65(5,2) = 4,423 GRAMS/MINUTE
CO= NDIR 0,35(29,7) + 0,65(30,1) = 29,951 GRAMS/MINUTE
CO2-NDIR 0,35(332,6) + 0,65(330,7) = 331,339 GRAMS/MINUTE
NO2-CL 0,35(3,5) + 0,65(3,5) = 3,513 GRAMS/MINUTE
FUEL 0,35(122,7) + 0,65(124,4) = 123,816 GRAMS/MINUTE
FUEL CONSUMED = 92,614 MILLILITRES/MINUTE

NOT REPRODUCIBLE

APPENDIX C-21

TABLE 10. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 10 TEST 2 4-28-75 IHC TT GAS 1974 7.8 LITRE V8 GVW 20412 KG HUM = 10.5 G/KG

MODE	CONCENTRATION CORRECTED HC	CO	CO2	NOX	----CALCULATED GRAMS/MINUTE----- HC	CO	CO2	NO2	FUEL	WT. FACT.	---WEIGHTED GRAMS/MINUTE--- HC	CO	CO2	NO2	FUEL
1 IDLE	172	672	.23	0	2.41	19.0	101.8	.00	43.96	.232	.56	4.4	24	.00	10.2
2 16 HG	160	494	1.37	74	2.24	14.0	612.8	3.41	202.52	.077	.17	1.1	47	.26	15.6
3 10 HG	259	766	2.18	409	3.63	21.7	975.3	18.89	322.09	.147	.53	3.2	143	2.78	47.3
4 16 HG	167	577	1.39	94	2.35	16.3	622.9	4.34	206.46	.077	.18	1.3	48	.33	15.9
5 19 HG	108	665	1.02	9	1.52	18.8	456.9	.41	154.98	.057	.09	1.1	26	.02	8.8
6 16 HG	133	549	1.42	89	1.86	15.5	632.9	4.11	209.26	.077	.14	1.2	49	.32	16.1
7 3 HG	478	4548	3.11	539	6.69	128.6	1387.6	24.90	508.28	.113	.76	14.5	157	2.81	57.4
8 16 HG	208	861	1.42	94	2.91	24.4	633.0	4.34	214.71	.077	.22	1.9	49	.33	16.5
9 C.T.	1138	586	.28	0	15.93	16.6	127.1	.02	64.24	.143	2.28	2.4	18	.00	9.2
---------------CYCLE COMPOSITE IN GRAMS/MINUTE---------------------------											4.93	31.0	561	6.86	197.2
1 IDLE	160	759	.25	0	2.23	21.5	110.2	.01	47.69	.232	.52	5.0	26	.00	11.1
2 16 HG	180	549	1.44	89	2.52	15.5	643.1	4.11	213.11	.077	.19	1.2	50	.32	16.4
3 10 HG	274	822	2.29	434	3.84	23.2	1021.0	20.04	337.50	.147	.57	3.4	150	2.95	49.6
4 16 HG	155	633	1.44	99	2.17	17.9	643.1	4.57	213.95	.077	.17	1.4	50	.35	16.5
5 19 HG	116	693	1.07	9	1.62	19.6	475.9	.41	161.49	.057	.09	1.1	27	.02	9.2
6 16 HG	148	576	1.46	104	2.07	16.3	653.2	4.80	216.25	.077	.16	1.3	50	.37	16.7
7 3 HG	503	4543	3.16	544	7.05	128.5	1413.6	25.13	516.75	.113	.80	14.5	160	2.84	58.4
8 16 HG	193	890	1.46	104	2.70	25.2	653.3	4.80	221.30	.077	.21	1.9	50	.37	17.0
9 C.T.	1138	585	.30	1	15.94	16.6	135.5	.03	66.89	.143	2.28	2.4	19	.00	9.6
---------------CYCLE COMPOSITE IN GRAMS/MINUTE---------------------------											4.98	32.2	582	7.22	204.4
1 IDLE	152	818	.23	1	2.13	23.1	101.9	.02	45.73	.232	.49	5.4	24	.01	10.6
2 16 HG	173	605	1.42	84	2.42	17.1	633.0	3.87	210.61	.077	.19	1.3	49	.30	16.2
3 10 HG	269	738	2.23	444	3.77	20.9	998.0	20.51	329.01	.147	.55	3.1	147	3.01	48.4
4 16 HG	158	661	1.42	104	2.21	18.7	633.0	4.80	211.19	.077	.17	1.4	49	.37	16.3
5 19 HG	131	750	1.04	9	1.83	21.2	466.4	.41	159.50	.057	.10	1.2	27	.02	9.1
6 16 HG	148	577	1.44	99	2.07	16.3	643.1	4.57	213.05	.077	.16	1.3	50	.35	16.4
7 3 HG	503	4589	3.14	549	7.05	129.8	1400.6	25.36	513.29	.113	.80	14.7	158	2.87	58.0
8 16 HG	193	890	1.46	109	2.70	25.2	653.3	5.03	221.30	.077	.21	1.9	50	.39	17.0
9 C.T.	1138	643	.30	1	15.94	18.2	135.5	.04	67.70	.143	2.28	2.6	19	.01	9.7
---------------CYCLE COMPOSITE IN GRAMS/MINUTE---------------------------											4.95	32.9	572	7.32	201.7
1 IDLE	189	759	.23	1	2.65	21.5	101.9	.04	45.43	.232	.62	5.0	24	.01	10.5
2 16 HG	183	605	1.42	89	2.56	17.1	633.0	4.11	210.75	.077	.20	1.3	49	.32	16.2
3 10 HG	279	599	2.21	424	3.91	16.9	986.6	19.58	323.59	.147	.57	2.5	145	2.88	47.6
4 16 HG	155	633	1.39	99	2.17	17.9	622.9	4.57	207.58	.077	.17	1.4	48	.35	16.0
5 19 HG	123	750	1.02	9	1.73	21.2	456.9	.41	156.40	.057	.10	1.2	26	.02	8.9
6 16 HG	148	549	1.42	94	2.07	15.5	632.9	4.34	209.47	.077	.16	1.2	49	.33	16.1
7 3 HG	503	4503	3.14	499	7.04	127.3	1400.5	23.05	512.08	.113	.80	14.4	158	2.60	57.9
8 16 HG	193	803	1.44	114	2.70	22.7	643.1	5.26	216.88	.077	.21	1.7	50	.41	16.7
9 C.T.	1113	672	.30	1	15.59	19.0	135.5	.05	67.75	.143	2.23	2.7	19	.01	9.7
---------------CYCLE COMPOSITE IN GRAMS/MINUTE---------------------------											5.04	31.4	567	6.93	199.6
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)-------------											4.96	31.6	571	7.04	200.8
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)-------------											5.00	32.1	570	7.13	200.6

FOUR CYCLE COMPOSITE -

HC- FID 0.35(5.0) + 0.65(5.0) = 4.983 GRAMS/MINUTE
CO- NDIR 0.35(31.6) + 0.65(32.1) = 31.938 GRAMS/MINUTE
CO2-NDIR 0.35(571.1) + 0.65(569.6) = 570.097 GRAMS/MINUTE
NO2-CL 0.35(7.0) + 0.65(7.1) = 7.098 GRAMS/MINUTE
FUEL 0.35(200.8) + 0.65(200.6) = 200.694 GRAMS/MINUTE
FUEL CONSUMED = 150.119 MILLILITRES/MINUTE

APPENDIX C-21.

TABLE 11. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 11 TEST 2 5-13-75 CHEVROLET D2GAS 1974 6.0 LITRE V8 GVW 18598 KG HUM = 8.7 G/KG

MODE	CONCENTRATION CORRECTED HC	CO	CO2	NOX	----CALCULATED GRAMS/MINUTE----- HC	CO	CO2	NO2	FUEL	WT. FACT.	---WEIGHTED GRAMS/MINUTE--- HC	CO	CO2	NO2	FUEL
1 IDLE	158	522	.22	0	2.28	15.2	103.4	.02	42.44	.232	.53	3.5	24	.00	9.8
2 16 HG	109	1125	.89	21	1.57	32.8	409.9	.93	147.15	.077	.12	2.5	32	.07	11.3
3 10 HG	204	1385	1.45	135	2.94	40.4	669.1	6.05	234.05	.147	.43	5.9	98	.89	34.4
4 16 HG	94	1005	.89	25	1.35	29.3	409.9	1.11	145.19	.077	.10	2.3	32	.09	11.2
5 19 HG	6	108	.65	4	.08	3.2	297.6	.18	95.56	.057	.00	.2	17	.01	5.4
6 16 HG	84	1005	.89	23	1.21	29.3	409.9	1.02	145.05	.077	.09	2.3	32	.08	11.2
7 3 HG	363	2466	2.17	335	5.24	71.9	999.4	15.04	356.21	.113	.59	8.1	113	1.70	40.3
8 16 HG	104	1155	.89	24	1.50	33.6	409.9	1.06	147.51	.077	.12	2.6	32	.08	11.4
9 C.T.	868	466	.15	0	12.52	13.6	69.6	.00	41.23	.143	1.79	1.9	10	.00	5.9
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3.78	29.3	388	2.92	140.9
1 IDLE	48	409	.24	0	.69	11.9	111.9	.02	41.91	.232	.16	2.8	26	.00	9.7
2 16 HG	114	1369	.89	18	1.65	39.9	409.9	.81	150.76	.077	.13	3.1	32	.06	11.6
3 10 HG	207	1891	1.48	140	2.98	55.1	679.6	6.28	244.73	.147	.44	8.1	100	.92	36.0
4 16 HG	96	1094	.91	23	1.39	31.9	419.4	1.02	149.54	.077	.11	2.5	32	.08	11.5
5 19 HG	1	108	.67	5	.01	3.2	306.8	.23	98.38	.057	.00	.2	17	.01	5.6
6 16 HG	86	1154	.91	22	1.25	33.6	419.4	.97	150.26	.077	.10	2.6	32	.07	11.6
7 3 HG	353	2641	2.17	335	5.10	76.9	999.5	15.04	358.60	.113	.58	8.7	113	1.70	40.5
8 16 HG	94	1215	.89	22	1.35	35.4	409.9	.99	148.24	.077	.10	2.7	32	.08	11.4
9 C.T.	843	438	.17	0	12.16	12.8	78.1	.00	43.12	.143	1.74	1.8	11	.00	6.2
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3.35	32.4	395	2.93	144.1
1 IDLE	45	409	.24	0	.65	11.9	111.9	.02	41.88	.232	.15	2.8	26	.00	9.7
2 16 HG	109	1462	.89	19	1.57	42.6	410.0	.84	152.05	.077	.12	3.3	32	.06	11.7
3 10 HG	189	1667	1.45	135	2.73	48.6	669.1	6.05	237.92	.147	.40	7.1	98	.89	35.0
4 16 HG	86	1185	.91	23	1.25	34.5	419.4	1.04	150.70	.077	.10	2.7	32	.08	11.6
5 19 HG	-11	108	.67	5	.17	3.2	306.8	.23	98.20	.057	.01	.2	17	.01	5.6
6 16 HG	84	1337	.91	21	1.21	39.0	419.5	.95	152.88	.077	.09	3.0	32	.07	11.8
7 3 HG	351	2891	2.17	335	5.06	84.2	999.5	15.04	362.19	.113	.57	9.5	113	1.70	40.9
8 16 HG	91	1338	.89	23	1.32	39.0	409.9	1.04	149.99	.077	.10	3.0	32	.08	11.5
9 C.T.	818	466	.17	0	11.80	13.6	78.1	.00	43.17	.143	1.69	1.9	11	.00	6.2
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3.22	33.5	394	2.90	144.0
1 IDLE	20	382	.24	0	.29	11.1	111.9	.02	41.11	.232	.07	2.6	26	.00	9.5
2 16 HG	94	1462	.89	19	1.36	42.6	409.9	.84	151.83	.077	.10	3.3	32	.06	11.7
3 10 HG	189	1860	1.45	135	2.73	54.2	669.1	6.05	240.72	.147	.40	8.0	98	.89	35.4
4 16 HG	76	1307	.89	21	1.10	38.1	409.9	.95	149.32	.077	.08	2.9	32	.07	11.5
5 19 HG	-24	135	.67	6	.35	3.9	306.8	.25	98.41	.057	.02	.2	17	.01	5.6
6 16 HG	46	1307	.89	21	.67	38.1	409.9	.93	148.89	.077	.05	2.9	32	.07	11.5
7 3 HG	348	3187	2.15	310	5.03	92.9	988.0	13.92	362.79	.113	.57	10.5	112	1.57	41.0
8 16 HG	84	1369	.89	22	1.21	39.9	409.9	.99	150.33	.077	.09	3.1	32	.08	11.6
9 C.T.	818	410	.17	0	11.80	11.9	78.0	.00	42.35	.143	1.69	1.7	11	.00	6.1
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3.04	35.2	391	2.77	143.8
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)---											3.57	30.9	392	2.93	142.5
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)---											3.13	34.3	392	2.83	143.9

FOUR CYCLE COMPOSITE -
HC- FID 0.35(3.6) + 0.65(3.1) = 3.281 GRAMS/MINUTE
CO- NDIR 0.35(30.9) + 0.65(34.3) = 33.125 GRAMS/MINUTE
CO2-NDIR 0.35(391.8) + 0.65(392.3) = 392.100 GRAMS/MINUTE
NO2-CL 0.35(2.9) + 0.65(2.8) = 2.867 GRAMS/MINUTE
FUEL 0.35(142.5) + 0.65(143.9) = 143.419 GRAMS/MINUTE
FUEL CONSUMED = 107.277 MILLILITRES/MINUTE

APPENDIX C-21

TABLE 12. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 12 TEST 2 5-14-75 FORD TTGAS 1972 7.8 LITRE V8 GVW 20412 KG HUM = 15.2 G/KG

MODE	CONCENTRATION CORRECTED HC	CO	CO2	NOX	----CALCULATED GRAMS/MINUTE----- HC	CO	CO2	NO2	FUEL	WT. FACT.	---WEIGHTED GRAMS/MINUTE--- HC	CO	CO2	NO2	FUEL
1 IDLE	66	1075	.19	0	.94	31.0	85.5	.01	43.26	.232	.22	7.2	20	.00	10.0
2 16 HG	282	3963	.98	27	4.02	114.1	443.6	1.50	200.55	.077	.31	8.8	34	.12	15.4
3 10 HG	416	3870	1.66	145	5.94	111.4	756.0	8.03	299.71	.147	.87	16.4	111	1.18	44.1
4 16 HG	292	4089	.95	28	4.16	117.8	434.0	1.56	199.49	.077	.32	9.1	33	.12	15.4
5 19 HG	226	3539	.69	8	3.22	101.9	312.9	.45	152.49	.057	.18	5.8	18	.03	8.7
6 16 HG	302	4129	.98	30	4.31	118.9	443.6	1.64	203.22	.077	.33	9.2	34	.13	15.6
7 3 HG	620	8319	2.35	155	8.84	239.6	1070.3	8.59	465.31	.113	1.00	27.1	121	.97	52.6
8 16 HG	314	4316	.98	26	4.49	124.3	443.6	1.42	206.08	.077	.35	9.6	34	.11	15.9
9 C.T.	1536	671	.10	0	21.91	19.3	44.1	.01	45.41	.143	3.13	2.8	6	.00	6.5
---CYCLE COMPOSITE IN GRAMS/MINUTE---											6.71	95.8	412	2.65	184.2
1 IDLE	121	1075	.17	1	1.73	31.0	77.1	.04	41.42	.232	.40	7.2	18	.01	9.6
2 16 HG	362	4470	.98	27	5.16	128.7	443.6	1.47	208.96	.077	.40	9.9	34	.11	16.1
3 10 HG	467	4368	1.66	145	6.66	125.8	756.1	8.03	307.57	.147	.98	18.5	111	1.18	45.2
4 16 HG	320	4339	1.00	31	4.56	125.0	453.2	1.72	209.49	.077	.35	9.6	35	.13	16.1
5 19 HG	248	3861	.69	7	3.54	111.2	313.0	.39	157.42	.057	.20	6.3	18	.02	9.0
6 16 HG	314	4296	1.00	28	4.49	123.7	453.2	1.56	208.81	.077	.35	9.5	35	.12	16.1
7 3 HG	645	8614	2.38	155	9.20	248.1	1082.2	8.58	473.66	.113	1.04	28.0	122	.97	53.5
8 16 HG	332	4391	1.00	28	4.74	126.5	453.2	1.56	210.42	.077	.36	9.7	35	.12	16.2
9 C.T.	1561	671	.10	0	22.27	19.3	44.1	.01	45.77	.143	3.18	2.8	6	.00	6.5
---CYCLE COMPOSITE IN GRAMS/MINUTE---											7.26	101.6	414	2.67	188.4
1 IDLE	124	1045	.19	1	1.76	30.1	85.5	.03	43.66	.232	.41	7.0	20	.01	10.1
2 16 HG	375	4689	.98	25	5.34	135.1	443.7	1.39	212.29	.077	.41	10.4	34	.11	16.3
3 10 HG	492	4540	1.66	135	7.01	130.8	756.1	7.47	310.39	.147	1.03	19.2	111	1.10	45.6
4 16 HG	327	4427	.98	26	4.66	127.5	443.6	1.45	207.84	.077	.36	9.8	34	.11	16.0
5 19 HG	258	3986	.67	6	3.69	114.8	303.9	.34	156.49	.057	.21	6.5	17	.02	8.9
6 16 HG	327	4382	1.00	29	4.66	126.2	453.2	1.61	210.22	.077	.36	9.7	35	.12	16.2
7 3 HG	670	8723	2.35	145	9.56	251.2	1070.4	8.03	471.82	.113	1.08	28.4	121	.91	53.3
8 16 HG	334	4316	.98	28	4.77	124.3	443.6	1.56	206.37	.077	.37	9.6	34	.12	15.9
9 C.T.	1611	665	.08	0	22.98	19.2	35.9	.00	43.01	.143	3.29	2.7	5	.00	6.3
---CYCLE COMPOSITE IN GRAMS/MINUTE---											7.51	103.4	412	2.49	188.7
1 IDLE	144	1136	.19	0	2.05	32.7	85.5	.03	45.24	.232	.48	7.6	20	.01	10.5
2 16 HG	415	4916	.95	23	5.91	141.6	434.2	1.28	213.10	.077	.46	10.9	33	.10	16.4
3 10 HG	492	4629	1.64	135	7.01	133.3	745.5	7.47	308.32	.147	1.03	19.6	110	1.10	45.3
4 16 HG	334	4427	.98	28	4.77	127.5	443.6	1.53	207.95	.077	.37	9.8	34	.12	16.0
5 19 HG	263	3862	.67	7	3.76	111.2	303.9	.39	154.79	.057	.21	6.3	17	.02	8.8
6 16 HG	335	4555	1.00	28	4.77	131.2	453.2	1.53	212.81	.077	.37	10.1	35	.12	16.4
7 3 HG	670	8929	2.35	135	9.56	257.1	1070.4	7.47	474.70	.113	1.08	29.1	121	.84	53.6
8 16 HG	342	4469	.98	23	4.88	128.7	443.6	1.28	208.66	.077	.38	9.9	34	.10	16.1
9 C.T.	1461	694	.12	0	20.84	20.0	52.4	.01	47.27	.143	2.98	2.9	7	.00	6.8
---CYCLE COMPOSITE IN GRAMS/MINUTE---											7.35	106.2	412	2.41	189.9
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)---											6.99	98.7	413	2.66	186.3
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)---											7.43	104.8	412	2.45	189.3

FOUR CYCLE COMPOSITE =

HC- FID 0.35(7.0) + 0.65(7.4) = 7.276 GRAMS/MINUTE
CO- NDIR 0.35(98.7) + 0.65(104.8) = 102.651 GRAMS/MINUTE
CO2-NDIR 0.35(413.1) + 0.65(411.8) = 412.265 GRAMS/MINUTE
NO2-CL 0.35(2.7) + 0.65(2.4) = 2.523 GRAMS/MINUTE
FUEL 0.35(186.3) + 0.65(189.3) = 188.243 GRAMS/MINUTE
FUEL CONSUMED = 140.806 MILLILITRES/MINUTE

APPENDIX C-21

TABLE 13. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 13 TEST 1 5-28-75 GMC TTGAS 1974 7,0 LITRE V8 GVW 20412 KG HUM = 10,7 G/KG

	CONCENTRATION CORRECTED				----CALCULATED GRAMS/MINUTE-----					WT.	---WEIGHTED GRAMS/MINUTE---				
MODE	HC	CO	CO2	NOX	HC	CO	CO2	NO2	FUEL	FACT.	HC	CO	CO2	NO2	FUEL
1 IDLE	124	626	,22	0	1,78	18,2	103,4	,02	43,43	,232	,41	4,2	24	,00	10,1
2 16 HG	139	1472	1,02	40	2,00	42,9	467,5	1,93	170,77	,077	,15	3,3	36	,15	13,1
3 10 HG	146	553	1,68	244	2,10	16,1	774,7	11,69	254,52	,147	,31	2,4	114	1,72	37,4
4 16 HG	59	477	1,06	44	,85	13,9	486,8	2,12	161,35	,077	,07	1,1	37	,16	12,4
5 19 HG	10	76	,73	6	,14	2,2	334,3	,28	106,74	,057	,01	,1	19	,02	6,1
6 16 HG	51	368	1,06	49	,74	10,7	486,8	2,36	159,66	,077	,06	,8	37	,18	12,3
7 3 HG	347	3824	2,43	354	5,00	111,4	1117,6	16,96	412,84	,113	,57	12,6	126	1,92	46,7
8 16 HG	89	672	1,08	54	1,28	19,6	496,7	2,60	167,69	,077	,10	1,5	38	,20	12,9
9 C.T.	909	570	,15	0	13,11	16,6	69,6	,02	43,31	,143	1,87	2,4	10	,00	6,2
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3,55	28,4	442	4,35	157,2
1 IDLE	119	769	,22	0	1,71	22,4	103,4	,02	45,44	,232	,40	5,2	24	,00	10,5
2 16 HG	116	989	1,04	44	1,68	28,8	477,2	2,12	166,51	,077	,13	2,2	37	,16	12,8
3 10 HG	173	719	1,71	249	2,50	20,9	785,5	11,93	260,74	,147	,37	3,1	115	1,75	38,3
4 16 HG	94	757	1,08	54	1,35	22,0	496,7	2,58	169,00	,077	,10	1,7	38	,20	13,0
5 19 HG	20	182	,77	9	,29	5,3	353,0	,44	114,28	,057	,02	,3	20	,03	6,5
6 16 HG	81	644	1,08	54	1,17	18,7	496,7	2,60	167,18	,077	,09	1,4	38	,20	12,9
7 3 HG	367	4658	2,40	314	5,29	135,7	1105,7	15,05	421,42	,113	,60	15,3	125	1,70	47,6
8 16 HG	94	700	1,08	58	1,35	20,4	496,7	2,79	168,18	,077	,10	1,6	38	,21	12,9
9 C.T.	859	542	,15	0	12,39	15,8	69,6	,02	42,17	,143	1,77	2,3	10	,00	6,0
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3,58	33,1	446	4,26	160,7
1 IDLE	134	916	,22	0	1,93	26,7	103,4	,02	47,77	,232	,45	6,2	24	,00	11,1
2 16 HG	129	1076	1,06	50	1,86	31,4	486,9	2,38	171,05	,077	,14	2,4	37	,18	13,2
3 10 HG	183	889	1,71	259	2,65	25,9	785,6	12,41	263,35	,147	,39	3,8	115	1,82	38,7
4 16 HG	99	728	1,08	49	1,43	21,2	496,7	2,36	168,66	,077	,11	1,6	38	,18	13,0
5 19 HG	25	129	,77	9	,36	3,7	353,0	,44	113,59	,057	,02	,2	20	,03	6,5
6 16 HG	86	644	1,08	57	1,25	18,7	496,7	2,72	167,25	,077	,10	1,4	38	,21	12,9
7 3 HG	369	4923	2,40	309	5,33	143,4	1105,7	14,81	425,29	,113	,60	16,2	125	1,67	48,1
8 16 HG	101	785	1,08	58	1,46	22,9	496,7	2,77	169,52	,077	,11	1,8	38	,21	13,1
9 C.T.	884	542	,15	0	12,75	15,8	69,6	,02	42,53	,143	1,82	2,3	10	,00	6,1
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3,74	35,9	447	4,32	162,5
1 IDLE	141	655	,22	1	2,04	19,1	103,4	,02	44,10	,232	,47	4,4	24	,01	10,2
2 16 HG	136	1226	1,06	46	1,97	35,7	487,0	2,22	173,32	,077	,15	2,7	37	,17	13,3
3 10 HG	191	1062	1,73	254	2,76	30,9	796,5	12,17	269,39	,147	,41	4,5	117	1,79	39,6
4 16 HG	104	843	1,08	57	1,50	24,5	496,7	2,74	170,39	,077	,12	1,9	38	,21	13,1
5 19 HG	15	102	,75	7	,22	3,0	343,6	,33	110,12	,057	,01	,2	20	,02	6,3
6 16 HG	86	700	1,08	54	1,25	20,4	496,7	2,60	168,07	,077	,10	1,6	38	,20	12,9
7 3 HG	392	5237	2,43	304	5,66	152,5	1117,8	14,57	433,98	,113	,64	17,2	126	1,65	49,0
8 16 HG	111	814	1,08	60	1,61	23,7	496,7	2,89	170,08	,077	,12	1,8	38	,22	13,1
9 C.T.	934	599	,15	0	13,47	17,4	69,6	,02	44,08	,143	1,93	2,5	10	,00	6,3
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3,94	36,9	449	4,27	164,0
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)---											3,56	30,7	444	4,31	158,9
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)---											3,84	36,4	448	4,29	163,2

FOUR CYCLE COMPOSITE =

HC= FID 0,35(3,6) + 0,65(3,8) = 3,744 GRAMS/MINUTE
CO= NDIR 0,35(30,7) + 0,65(36,4) = 34,427 GRAMS/MINUTE
CO2=NDIR 0,35(444,2) + 0,65(447,9) = 446,616 GRAMS/MINUTE
NO2=CL 0,35(4,3) + 0,65(4,3) = 4,298 GRAMS/MINUTE
FUEL 0,35(158,9) + 0,65(163,2) = 161,728 GRAMS/MINUTE
FUEL CONSUMED = 120,973 MILLILITRES/MINUTE

NOT REPRODUCIBLE

APPENDIX C-21

TABLE 14. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 14 TEST 1 5-28-75 FORD TTGAS 1969 6,4 LITRE V8 GVW 19051 KG HUM = 9,3 G/KG

MODE	CONCENTRATION CORRECTED HC	CO	CO2	NOX	----CALCULATED GRAMS/MINUTE----- HC	CO	CO2	NO2	FUEL	WT, FACT,	---WEIGHTED GRAMS/MINUTE--- HC	CO	CO2	NO2	FUEL
1 IDLE	223	1213	,24	1	3,16	34,7	110,1	,05	55,10	,232	,73	8,1	26	,01	12,8
2 16 HG	97	1858	,97	19	1,38	53,2	440,4	,86	166,70	,077	,11	4,1	34	,07	12,8
3 10 HG	85	2136	1,50	41	1,21	61,1	677,8	1,85	245,39	,147	,18	9,0	100	,27	36,1
4 16 HG	85	1890	1,00	20	1,20	54,1	449,9	,91	169,97	,077	,09	4,2	35	,07	13,1
5 19 HG	62	1418	,73	5	,87	40,6	328,8	,23	124,73	,057	,05	2,3	[illegible]	,01	7,1
6 16 HG	82	1792	,97	18	1,16	51,3	440,4	,80	165,55	,077	,09	4,0	34	,06	12,7
7 3 HG	508	11562	1,93	65	7,20	330,9	871,1	2,91	446,10	,113	,81	37,4	98	,33	50,4
8 16 HG	145	1861	1,02	27	2,05	53,3	459,5	1,20	173,43	,077	,16	4,1	35	,09	13,4
9 C,T,	1128	593	,23	1	15,99	17,0	101,7	,03	56,50	,143	2,29	2,4	15	,00	8,1
--------------CYCLE COMPOSITE IN GRAMS/MINUTE------------------------------------											4,51	75,5	395	,92	166,5
1 IDLE	268	1244	,24	1	3,80	35,6	110,1	,04	56,18	,232	,88	8,3	26	,01	13,0
2 16 HG	122	2055	1,00	19	1,73	58,8	450,0	,84	172,87	,077	,13	4,5	35	,06	13,3
3 10 HG	98	2236	1,52	43	1,39	64,0	688,2	1,94	250,25	,147	,20	9,4	101	,29	36,8
4 16 HG	100	2022	1,00	19	1,41	57,9	450,0	,86	172,07	,077	,11	4,5	35	,07	13,2
5 19 HG	77	1449	,75	5	1,09	41,5	337,9	,23	128,26	,057	,06	2,4	19	,01	7,3
6 16 HG	95	1956	1,00	19	1,34	56,0	449,9	,84	171,05	,077	,10	4,3	35	,06	13,2
7 3 HG	533	11439	1,93	65	7,55	327,4	871,1	2,91	444,70	,113	,85	37,0	98	,33	50,3
8 16 HG	150	1860	1,04	28	2,12	53,2	469,0	1,27	176,51	,077	,16	4,1	36	,10	13,6
9 C,T,	1053	5[illegible]	,24	1	14,93	16,1	110,1	,03	57,67	,143	2,14	2,3	16	,00	8,2
--------------CYCLE COMPOSITE IN GRAMS/MINUTE------------------------------------											4,65	76,7	400	,93	169,0
1 IDLE	301	1275	,24	1	4,26	36,5	110,1	,04	57,08	,232	,99	8,5	26	,01	13,2
2 16 HG	127	1989	1,00	20	1,80	56,9	449,9	,89	171,99	,077	,14	4,4	35	,07	13,2
3 10 HG	98	2168	1,55	43	1,39	62,0	698,5	1,94	252,55	,147	,20	9,1	103	,29	37,1
4 16 HG	107	1955	1,02	20	1,52	55,9	459,5	,91	174,23	,077	,12	4,3	35	,07	13,4
5 19 HG	72	1417	,75	5	1,01	40,6	337,9	,23	127,74	,057	,06	2,3	19	,01	7,3
6 16 HG	97	1956	1,00	18	1,38	56,0	449,9	,80	171,09	,077	,11	4,3	35	,06	13,2
7 3 HG	533	11562	1,93	63	7,55	330,9	871,1	2,84	446,45	,113	,85	37,4	98	,32	50,4
8 16 HG	157	2178	1,02	25	2,23	62,3	459,5	1,11	178,11	,077	,17	4,8	35	,09	13,7
9 C,T,	1028	564	,23	1	14,58	16,2	101,7	,03	54,67	,143	2,08	2,3	15	,00	7,8
--------------CYCLE COMPOSITE IN GRAMS/MINUTE------------------------------------											4,72	77,4	401	,92	169,5
1 IDLE	288	1244	,24	1	4,09	35,6	110,1	,03	56,46	,232	,95	8,3	26	,01	13,1
2 16 HG	127	2090	,97	19	1,80	59,8	440,5	,84	170,43	,077	,14	4,6	34	,06	13,1
3 10 HG	106	2304	1,52	44	1,50	65,9	688,2	1,97	251,33	,147	,22	9,7	101	,29	36,9
4 16 HG	112	2023	,97	20	1,59	57,9	440,4	,91	169,26	,077	,12	4,5	34	,07	13,0
5 19 HG	74	1481	,73	5	1,05	42,4	328,8	,23	125,79	,057	,06	2,4	19	,01	7,2
6 16 HG	110	1956	,97	21	1,55	56,0	440,4	,95	168,28	,077	,12	4,3	34	,07	13,0
7 3 HG	508	11573	1,88	63	7,20	331,2	849,2	2,82	439,34	,113	,81	37,4	96	,32	49,6
8 16 HG	150	2114	1,00	24	2,12	60,5	450,0	1,07	174,10	,077	,16	4,7	35	,08	13,4
9 C,T,	1103	621	,23	1	15,64	17,8	101,7	,03	56,55	,143	2,24	2,5	15	,00	8,1
--------------CYCLE COMPOSITE IN GRAMS/MINUTE------------------------------------											4,82	78,4	392	,92	167,5
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)------------------------------											4,58	76,1	397	,93	167,7
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)------------------------------											4,77	77,9	396	,92	168,5

FOUR CYCLE COMPOSITE -

HC- FID 0,35(4,6) + 0,65(4,8) = 4,704 GRAMS/MINUTE
CO- NDIR 0,35(76,1) + 0,65(77,9) = 77,262 GRAMS/MINUTE
CO2-NDIR 0,35(397,5) + 0,65(396,4) = 396,793 GRAMS/MINUTE
NO2-CL 0,35(,9) + 0,65(,9) = ,922 GRAMS/MINUTE
FUEL 0,35(167,7) + 0,65(168,5) = 168,203 GRAMS/MINUTE
FUEL CONSUMED = 125,816 MILLILITRES/MINUTE

APPENDIX C-21

TABLE 15. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 15 TEST 1 6-13-75 GMC D3GAS 1974 7,0 LITRE V8 GVW 20185 KG HUM = 10,4 G/KG

MODE	CONCENTRATION CORRECTED HC	CO	CO2	NOX	----CALCULATED GRAMS/MINUTE----- HC	CO	CO2	NO2	FUEL	WT. FACT.	---WEIGHTED GRAMS/MINUTE--- HC	CO	CO2	NO2	FUEL
1 IDLE	102	1013	,19	0	1,50	30,2	88,6	,01	44,46	,232	,35	7,0	21	,00	10,3
2 16 HG	143	2833	,97	22	2,12	84,6	459,8	1,05	189,13	,077	,16	6,5	35	,08	14,6
3 10 HG	221	2653	1,66	160	3,28	79,2	783,7	7,75	289,81	,147	,48	11,6	115	1,14	42,6
4 16 HG	143	2616	1,00	27	2,12	78,1	469,6	1,30	189,03	,077	,16	6,0	36	,10	14,6
5 19 HG	79	1091	,75	11	1,17	32,6	352,6	,54	128,57	,057	,07	1,9	20	,03	7,3
6 16 HG	136	2652	1,00	28	2,01	79,2	469,6	1,35	189,45	,077	,15	6,1	36	,10	14,6
7 3 HG	355	12702	1,93	40	5,25	379,3	909,2	1,93	480,17	,113	,59	42,9	103	,22	54,3
8 16 HG	161	2912	1,00	20	2,38	87,0	469,7	,96	193,70	,077	,18	6,7	36	,07	14,9
9 C.T.	842	691	,15	0	12,45	20,6	71,4	,00	45,20	,143	1,78	2,9	10	,00	6,5
----------------CYCLE COMPOSITE IN GRAMS/MINUTE											3,93	91,7	413	1,75	179,5
1 IDLE	127	1073	,19	0	1,87	32,0	88,7	,01	45,73	,232	,43	7,4	21	,00	10,6
2 16 HG	164	3016	1,00	23	2,42	90,1	469,7	1,10	195,28	,077	,19	6,9	36	,08	15,0
3 10 HG	242	2904	1,66	165	3,57	86,7	783,7	7,99	293,86	,147	,53	12,7	115	1,17	43,2
4 16 HG	154	2794	1,02	27	2,27	83,5	479,6	1,30	194,98	,077	,17	6,4	37	,10	15,0
5 19 HG	79	1091	,77	11	1,17	32,6	362,1	,54	131,58	,057	,07	1,9	21	,03	7,5
6 16 HG	139	2650	1,02	27	2,05	79,2	479,6	1,30	192,61	,077	,16	6,1	37	,10	14,8
7 3 HG	355	12038	2,00	50	5,25	359,5	943,7	2,41	481,23	,113	,59	40,6	107	,27	54,4
8 16 HG	171	3116	1,04	23	2,53	93,0	489,7	1,10	203,16	,077	,20	7,2	38	,08	15,6
9 C.T.	867	691	,13	0	12,82	20,6	62,8	,01	42,86	,143	1,83	3,0	9	,00	6,1
----------------CYCLE COMPOSITE IN GRAMS/MINUTE											4,17	92,2	420	1,85	182,3
1 IDLE	114	1013	,19	0	1,69	30,2	88,6	,01	44,65	,232	,39	7,0	21	,00	10,4
2 16 HG	174	3052	1,02	25	2,57	91,2	479,7	1,20	199,10	,077	,20	7,0	37	,09	15,3
3 10 HG	239	2904	1,66	160	3,54	86,7	783,7	7,75	293,82	,147	,52	12,7	115	1,14	43,2
4 16 HG	156	2759	1,00	29	2,31	82,4	469,7	1,39	191,35	,077	,18	6,3	36	,11	14,7
5 19 HG	84	1121	,77	11	1,25	33,5	362,1	,52	132,10	,057	,07	1,9	21	,03	7,5
6 16 HG	146	2794	1,02	29	2,16	83,5	479,6	1,42	194,86	,077	,17	6,4	37	,11	15,0
7 3 HG	330	12165	2,00	55	4,88	363,3	943,7	2,66	482,75	,113	,55	41,1	107	,30	54,6
8 16 HG	171	3117	1,02	27	2,53	93,1	479,7	1,32	200,03	,077	,20	7,2	37	,10	15,4
9 C.T.	841	691	,11	0	12,45	20,6	54,2	,01	39,78	,143	1,78	3,0	8	,00	5,7
----------------CYCLE COMPOSITE IN GRAMS/MINUTE											4,05	92,6	418	1,88	181,8
1 IDLE	112	1013	,17	0	1,65	30,3	80,0	,01	41,88	,232	,38	7,0	19	,00	9,7
2 16 HG	166	2905	1,00	26	2,46	86,8	469,7	1,25	193,67	,077	,19	6,7	36	,10	14,9
3 10 HG	239	3088	1,66	160	3,54	92,2	783,8	7,75	296,55	,147	,52	13,6	115	1,14	43,6
4 16 HG	161	2942	1,00	25	2,38	87,9	469,7	1,20	194,14	,077	,18	6,8	36	,09	14,9
5 19 HG	82	1151	,75	11	1,21	34,4	352,6	,52	129,50	,057	,07	2,0	20	,03	7,4
6 16 HG	143	2796	1,00	26	2,12	83,5	469,7	1,25	191,70	,077	,16	6,4	36	,10	14,8
7 3 HG	330	13237	1,93	44	4,88	395,3	909,3	2,15	487,75	,113	,55	44,7	103	,24	55,1
8 16 HG	171	3117	1,02	27	2,53	93,1	479,7	1,32	200,03	,077	,20	7,2	37	,10	15,4
9 C.T.	841	691	,11	0	12,45	20,6	54,2	,00	39,78	,143	1,78	3,0	8	,00	5,7
----------------CYCLE COMPOSITE IN GRAMS/MINUTE											4,03	97,2	410	1,80	181,5
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)											4,05	91,9	416	1,80	181,0
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)											4,04	94,9	414	1,84	181,7

FOUR CYCLE COMPOSITE -

HC- FID 0,35(4,1) + 0,65(4,0) = 4,045 GRAMS/MINUTE
CO- NDIR 0,35(91,9) + 0,65(94,9) = 93,880 GRAMS/MINUTE
CO2-NDIR 0,35(416,2) + 0,65(413,8) = 414,638 GRAMS/MINUTE
NO2-CL 0,35(1,8) + 0,65(1,8) = 1,827 GRAMS/MINUTE
FUEL 0,35(181,0) + 0,65(181,7) = 181,413 GRAMS/MINUTE
FUEL CONSUMED = 135,697 MILLILITRES/MINUTE

NOT REPRODUCIBLE

APPENDIX C-21

TABLE 16. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 16 TEST 1 6-14-75 CHEVROLET D3GAS 1966 6,0 LITRE V8 GVW 19051 KG HUM = 11,1 G/KG

MODE	CONCENTRATION CORRECTED HC	CO	CO2	NOX	----CALCULATED GRAMS/MINUTE----- HC	CO	CO2	NO2	FUEL	WT. FACT.	---WEIGHTED GRAMS/MINUTE--- HC	CO	CO2	NO2	FUEL
1 IDLE	322	1565	,17	-0	4,86	47,6	81,8	-,01	54,36	,232	1,13	11,1	19	,00	12,6
2 16 HG	107	679	,89	49	1,61	20,7	429,2	2,50	147,32	,077	,12	1,6	33	,19	11,3
3 10 HG	292	3097	1,36	138	4,42	94,5	657,7	7,03	258,77	,147	,65	13,9	97	1,03	38,0
4 16 HG	87	794	,87	45	1,31	24,2	419,3	2,27	145,60	,077	,10	1,9	32	,18	11,2
5 19 HG	85	714	,41	12	1,28	21,8	199,0	,59	74,87	,057	,07	1,2	11	,03	4,3
6 16 HG	82	880	,89	51	1,24	26,8	429,2	2,60	149,98	,077	,10	2,1	33	,20	11,5
7 3 HG	582	13285	1,60	43	8,80	405,4	769,0	2,21	452,41	,113	,99	45,8	87	,25	51,1
8 16 HG	114	1115	,89	47	1,73	34,0	429,3	2,38	154,04	,077	,13	2,6	33	,18	11,9
9 C,T,	972	1161	,13	0	14,69	35,4	64,3	,02	52,53	,143	2,10	5,1	9	,00	7,5
---CYCLE COMPOSITE IN GRAMS/MINUTE---											5,40	85,2	355	2,06	159,5
1 IDLE	359	1629	,17	0	5,43	49,7	81,9	,00	55,90	,232	1,26	11,5	19	,00	13,0
2 16 HG	127	909	,89	50	1,92	27,7	429,2	2,55	151,10	,077	,15	2,1	33	,20	11,6
3 10 HG	297	3438	1,36	143	4,49	104,9	657,7	7,29	264,03	,147	,66	15,4	97	1,07	38,8
4 16 HG	92	997	,89	51	1,39	30,4	429,3	2,60	151,90	,077	,11	2,3	33	,20	11,7
5 19 HG	188	740	,61	12	2,84	22,6	292,7	,62	106,40	,057	,16	1,3	17	,04	6,1
6 16 HG	94	967	,89	51	1,43	29,5	429,3	2,60	151,50	,077	,11	2,3	33	,20	11,7
7 3 HG	582	13566	1,57	39	8,80	414,0	757,9	1,98	453,16	,113	,99	46,8	86	,22	51,2
8 16 HG	114	1115	,89	45	1,73	34,0	429,3	2,30	154,04	,077	,13	2,6	33	,18	11,9
9 C,T,	947	1161	,15	0	14,31	35,4	73,1	,01	54,92	,143	2,05	5,1	10	,00	7,9
---CYCLE COMPOSITE IN GRAMS/MINUTE---											5,62	89,5	361	2,10	163,8
1 IDLE	349	1597	,15	0	5,28	48,7	73,0	,00	52,48	,232	1,22	11,3	17	,00	12,2
2 16 HG	129	967	,89	50	1,95	29,5	429,3	2,55	152,03	,077	,15	2,3	33	,20	11,7
3 10 HG	295	3477	1,36	143	4,46	106,1	657,7	7,29	264,58	,147	,66	15,6	97	1,07	38,9
4 16 HG	104	938	,89	53	1,58	28,6	429,2	2,68	151,20	,077	,12	2,2	33	,21	11,6
5 19 HG	173	711	,61	14	2,62	21,7	292,7	,69	105,74	,057	,15	1,2	17	,04	6,0
6 16 HG	99	1085	,89	48	1,50	33,1	429,3	2,45	153,36	,077	,12	2,6	33	,19	11,8
7 3 HG	582	13428	1,57	37	8,80	409,8	757,9	1,88	451,07	,113	,99	46,3	86	,21	51,0
8 16 HG	122	1262	,89	50	1,84	38,5	429,3	2,55	156,39	,077	,14	3,0	33	,20	12,0
9 C,T,	922	1161	,15	0	13,93	35,4	73,0	,01	54,54	,143	1,99	5,1	10	,00	7,8
---CYCLE COMPOSITE IN GRAMS/MINUTE---											5,54	89,5	359	2,11	163,1
1 IDLE	344	1629	,15	0	5,20	49,7	73,0	,00	52,89	,232	1,21	11,5	17	,00	12,3
2 16 HG	127	997	,89	50	1,92	30,4	429,3	2,53	152,44	,077	,15	2,3	33	,19	11,7
3 10 HG	292	3286	1,34	148	4,42	100,3	646,9	7,54	258,26	,147	,65	14,7	95	1,11	38,0
4 16 HG	94	1026	,89	48	1,43	31,3	429,3	2,45	152,39	,077	,11	2,4	33	,19	11,7
5 19 HG	168	711	,61	13	2,54	21,7	292,7	,67	105,67	,057	,14	1,2	17	,04	6,0
6 16 HG	99	997	,89	56	1,50	30,4	429,3	2,83	152,02	,077	,12	2,3	33	,22	11,7
7 3 HG	582	13291	1,57	37	8,80	405,6	757,9	1,91	448,99	,113	,99	45,8	86	,22	50,7
8 16 HG	119	1175	,89	50	1,80	35,9	429,3	2,55	155,03	,077	,14	2,8	33	,20	11,9
9 C,T,	922	1161	,15	0	13,93	35,4	73,0	,00	54,54	,143	1,99	5,1	10	,00	7,8
---CYCLE COMPOSITE IN GRAMS/MINUTE---											5,50	88,3	357	2,16	161,9
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)---											5,51	87,3	358	2,08	161,6
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)---											5,52	88,9	358	2,14	162,5

FOUR CYCLE COMPOSITE -

HC- FID 0,35(5,5) + 0,65(5,5) = 5,518 GRAMS/MINUTE
CO- NDIR 0,35(87,3) + 0,65(88,9) = 88,348 GRAMS/MINUTE
CO2-NDIR 0,35(357,6) + 0,65(357,8) = 357,741 GRAMS/MINUTE
NO2-CL 0,35(2,1) + 0,65(2,1) = 2,117 GRAMS/MINUTE
FUEL 0,35(161,6) + 0,65(162,5) = 162,191 GRAMS/MINUTE
FUEL CONSUMED = 121,319 MILLILITRES/MINUTE

APPENDIX C-21

TABLE 17. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 17 TEST 1 6-18-75 IHC CAL D2GAS 1975 5,7 LITRE V8 GVW 2938 KG HUM = 14,1 G/KG

	CONCENTRATION CORRECTED				CALCULATED GRAMS/MINUTE					WT.	WEIGHTED GRAMS/MINUTE				
MODE	HC	CO	CO2	NOX	HC	CO	CO2	NO2	FUEL	FACT.	HC	CO	CO2	NO2	FUEL
1 IDLE	15	45	,19	1	,22	1,3	90,4	,05	29,41	,232	,05	,3	21	,01	6,8
2 16 HG	26	269	,86	17	,38	7,9	401,4	,90	130,96	,077	,03	,6	31	,07	10,1
3 10 HG	77	640	1,34	55	1,12	18,8	623,9	2,97	207,31	,147	,16	2,8	92	,44	30,5
4 16 HG	19	231	,87	20	,27	6,8	406,0	1,09	131,74	,077	,02	,5	31	,08	10,1
5 19 HG	11	181	,65	12	,16	5,3	303,4	,66	98,53	,057	,01	,3	17	,04	5,6
6 16 HG	16	244	,86	20	,24	7,2	401,4	1,06	130,44	,077	,02	,6	31	,08	10,0
7 3 HG	86	2464	2,05	130	1,25	72,5	951,0	7,06	337,25	,113	,14	8,2	107	,80	38,1
8 16 HG	14	243	,89	22	,20	7,2	415,2	1,17	134,75	,077	,02	,6	32	,09	10,4
9 C,T,	1233	82	,05	1	17,97	2,4	22,4	,03	26,25	,143	2,57	,3	3	,00	3,8
CYCLE COMPOSITE IN GRAMS/MINUTE											3,02	14,1	366	1,61	125,4
1 IDLE	43	57	,19	1	,62	1,7	90,4	,06	29,99	,232	,14	,4	21	,01	7,0
2 16 HG	41	256	,87	18	,60	7,5	406,0	,96	132,44	,077	,05	,6	31	,07	10,2
3 10 HG	77	680	1,34	57	1,12	20,0	623,9	3,08	207,89	,147	,16	2,9	92	,45	30,6
4 16 HG	26	243	,89	22	,38	7,2	415,2	1,17	134,93	,077	,03	,6	32	,09	10,4
5 19 HG	18	181	,67	12	,27	5,3	312,1	,66	101,39	,057	,02	,3	18	,04	5,8
6 16 HG	21	243	,88	21	,31	7,2	410,6	1,12	133,41	,077	,02	,6	32	,09	10,3
7 3 HG	81	2619	2,15	115	1,18	77,1	997,5	6,24	354,11	,113	,13	8,7	113	,71	40,0
8 16 HG	19	256	,90	23	,27	7,5	419,8	1,23	136,46	,077	,02	,6	32	,09	10,5
9 C,T,	1233	95	,05	0	17,97	2,8	22,4	,02	26,43	,143	2,57	,4	3	,00	3,8
CYCLE COMPOSITE IN GRAMS/MINUTE											3,15	15,0	374	1,56	128,5
1 IDLE	45	95	,19	1	,66	2,8	90,4	,05	30,58	,232	,15	,6	21	,01	7,1
2 16 HG	41	371	,90	18	,60	10,9	419,8	,96	136,47	,077	,05	,8	32	,07	10,7
3 10 HG	77	827	1,35	58	1,12	24,3	629,1	3,13	211,66	,147	,16	3,6	92	,46	31,1
4 16 HG	29	281	,89	22	,42	8,3	415,2	1,17	135,52	,077	,03	,6	32	,09	10,4
5 19 HG	18	207	,66	12	,27	6,1	307,8	,63	100,38	,057	,02	,3	18	,04	5,7
6 16 HG	26	281	,89	21	,38	8,3	415,2	1,12	135,49	,077	,03	,6	32	,09	10,4
7 3 HG	76	2549	2,15	110	1,10	75,0	997,5	5,97	353,01	,113	,12	8,5	113	,67	39,9
8 16 HG	19	243	,92	23	,27	7,2	429,0	1,25	139,19	,077	,02	,6	33	,10	10,7
9 C,T,	1233	95	,06	0	17,97	2,8	29,9	,02	28,78	,143	2,57	,4	4	,00	4,1
CYCLE COMPOSITE IN GRAMS/MINUTE											3,16	16,1	377	1,53	130,2
1 IDLE	50	132	,20	1	,73	3,9	94,3	,06	32,42	,232	,17	,9	22	,01	7,5
2 16 HG	44	396	,90	19	,64	11,7	419,8	1,01	138,88	,077	,05	,9	32	,08	10,7
3 10 HG	77	854	1,36	56	1,12	25,1	634,2	3,05	213,68	,147	,16	3,7	93	,45	31,4
4 16 HG	29	307	,90	22	,42	9,0	419,8	1,20	137,35	,077	,03	,7	32	,09	10,6
5 19 HG	21	219	,69	13	,31	6,4	320,9	,68	104,74	,057	,02	,4	18	,04	6,0
6 16 HG	24	294	,89	22	,35	8,7	415,2	1,17	135,64	,077	,03	,7	32	,09	10,4
7 3 HG	78	2687	2,20	95	1,14	79,1	1021,0	5,15	362,46	,113	,13	8,9	115	,58	41,0
8 16 HG	19	269	,92	24	,27	7,9	429,0	1,28	139,56	,077	,02	,6	33	,10	10,7
9 C,T,	1183	120	,06	0	17,24	3,5	29,9	,02	28,42	,143	2,46	,5	4	,00	4,1
CYCLE COMPOSITE IN GRAMS/MINUTE											3,08	17,3	383	1,44	132,4
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)											3,08	14,6	370	1,59	126,9
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)											3,12	16,7	380	1,49	131,3

FOUR CYCLE COMPOSITE -

HC- FID 0,35(3,1) + 0,65(3,1) = 3,105 GRAMS/MINUTE
CO- NDIR 0,35(14,6) + 0,65(16,7) = 15,950 GRAMS/MINUTE
CO2-NDIR 0,35(369,6) + 0,65(380,0) = 376,370 GRAMS/MINUTE
NO2-CL 0,35(1,6) + 0,65(1,5) = 1,523 GRAMS/MINUTE
FUEL 0,35(126,9) + 0,65(131,3) = 129,765 GRAMS/MINUTE
FUEL CONSUMED = 97,064 MILLILITRES/MINUTE

NOT REPRODUCIBLE

APPENDIX C-21

TABLE 18. MASS EMISSION BY MODIFIED NINE-MODE FTP

TRUCK 18 TEST 3 7-11-75 FORD CAL, TTGAS 1975 6,4 LITRE V8 GVW 1995R KG HUM = 9,5 G/KG

MODE	CONCENTRATION CORRECTED HC	CO	CO2	NOX	----CALCULATED GRAMS/MINUTE----- HC	CO	CO2	NO2	FUEL	WT. FACT.	---WEIGHTED GRAMS/MINUTE--- HC	CO	CO2	NO2	FUEL
1 IDLE	8	261	,26	1	,13	7,9	123,6	,03	43,05	,232	,03	1,8	29	,01	10,0
2 16 HG	13	207	,97	14	,20	6,3	462,7	,67	149,29	,077	,02	,5	36	,05	11,5
3 10 HG	70	785	1,47	56	1,05	23,8	701,9	2,66	234,31	,147	,15	3,5	103	,39	34,4
4 16 HG	13	195	,99	25	,20	5,9	472,7	1,17	152,26	,077	,02	,5	36	,09	11,7
5 19 HG	5	108	,76	13	,07	3,3	364,4	,60	116,67	,057	,00	,2	21	,03	6,7
6 16 HG	8	220	1,01	29	,12	6,7	482,7	1,37	155,73	,077	,01	,5	37	,11	12,0
7 3 HG	57	314	2,13	180	,85	9,5	1020,6	8,58	327,58	,113	,10	1,1	115	,97	37,0
8 16 HG	8	232	1,03	35	,12	7,0	492,8	1,65	159,10	,077	,01	,5	38	,13	12,3
9 C.T.	1211	85	,11	1	18,16	2,6	53,6	,03	36,34	,143	2,60	,4	8	,00	5,2
---CYCLE COMPOSITE IN GRAMS/MINUTE---											2,93	8,9	423	1,78	140,8
1 IDLE	41	287	,24	1	,61	8,7	114,7	,03	41,12	,232	,14	2,0	27	,01	9,5
2 16 HG	33	207	,97	15	,50	6,3	462,7	,70	149,59	,077	,04	,5	36	,05	11,5
3 10 HG	80	758	1,49	59	1,20	23,0	712,8	2,80	237,48	,147	,18	3,4	105	,41	34,9
4 16 HG	23	182	,99	20	,35	5,5	472,7	,96	152,22	,077	,03	,4	36	,07	11,7
5 19 HG	15	121	,76	13	,22	3,7	364,4	,62	117,01	,057	,01	,2	21	,04	6,7
6 16 HG	18	170	,99	17	,27	5,1	472,7	,82	151,96	,077	,02	,4	36	,06	11,7
7 3 HG	62	338	2,16	180	,92	10,2	1032,6	8,58	331,82	,113	,10	1,2	117	,97	37,5
8 16 HG	13	232	1,05	30	,20	7,0	502,9	1,41	162,37	,077	,02	,5	39	,11	12,5
9 C.T.	1236	97	,11	1	18,54	2,9	53,6	,03	36,91	,143	2,65	,4	8	,00	5,3
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3,19	9,0	424	1,73	141,3
1 IDLE	43	287	,24	1	,65	8,7	114,7	,04	41,16	,232	,15	2,0	27	,01	9,5
2 16 HG	38	257	,99	15	,57	7,8	472,7	,72	153,58	,077	,04	,6	36	,06	11,8
3 10 HG	85	798	1,49	58	1,27	24,2	712,8	2,78	238,16	,147	,19	3,6	105	,41	35,0
4 16 HG	28	182	,99	20	,42	5,5	472,7	,94	152,30	,077	,03	,4	36	,07	11,7
5 19 HG	22	121	,76	18	,34	3,7	364,4	,84	117,12	,057	,02	,2	21	,05	6,7
6 16 HG	23	245	1,03	34	,35	7,4	492,8	1,60	159,51	,077	,03	,6	38	,12	12,3
7 3 HG	67	363	2,18	185	1,00	11,0	1044,7	8,82	336,07	,113	,11	1,2	118	1,00	38,0
8 16 HG	18	220	1,01	22	,27	6,7	482,7	1,06	155,88	,077	,02	,5	37	,08	12,0
9 C.T.	1286	110	,11	1	19,29	3,3	53,6	,03	37,85	,143	2,76	,5	8	,00	5,4
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3,35	9,6	426	1,80	142,5
1 IDLE	46	299	,26	1	,69	9,1	123,6	,04	44,19	,232	,16	2,1	29	,01	10,3
2 16 HG	46	320	1,03	30	,69	9,7	492,8	1,41	160,99	,077	,05	,7	38	,11	12,4
3 10 HG	92	852	1,49	60	1,38	25,8	712,8	2,85	239,08	,147	,20	3,8	105	,42	35,1
4 16 HG	33	207	,99	21	,50	6,3	472,7	,98	152,75	,077	,04	,5	36	,08	11,8
5 19 HG	22	121	,76	13	,34	3,7	364,4	,62	117,12	,057	,02	,2	21	,04	6,7
6 16 HG	26	270	1,03	33	,39	8,2	492,8	1,58	159,93	,077	,03	,6	38	,12	12,3
7 3 HG	69	338	2,16	190	1,04	10,2	1032,6	9,06	331,93	,113	,12	1,2	117	1,02	37,5
8 16 HG	23	220	1,01	24	,35	6,7	482,7	1,13	155,96	,077	,03	,5	37	,09	12,0
9 C.T.	1311	110	,11	1	19,66	3,3	53,6	,03	38,23	,143	2,81	,5	8	,00	5,5
---CYCLE COMPOSITE IN GRAMS/MINUTE---											3,46	10,1	428	1,88	143,5
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)---											3,06	9,0	423	1,75	141,0
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)---											3,41	9,9	427	1,84	143,0

FOUR CYCLE COMPOSITE -

HC- FID 0,35(3,1) + 0,65(3,4) = 3,285 GRAMS/MINUTE

CO- NDIR 0,35(9,0) + 0,65(9,9) = 9,553 GRAMS/MINUTE

CO2-NDIR 0,35(423,2) + 0,65(426,9) = 425,619 GRAMS/MINUTE

NO2-CL 0,35(1,8) + 0,65(1,8) = 1,811 GRAMS/MINUTE

FUEL 0,35(141,0) + 0,65(143,0) = 142,313 GRAMS/MINUTE

FUEL CONSUMED = 106,450 MILLILITRES/MINUTE

APPENDIX D

DIESEL TRUCK RESULTS

D-1 through D-12 Summarized Results of 12 Diesel Trucks

APPENDIX D-1

TABLF 19-1. TRUCK 019 SUMMARY - GRAMS/KILOMETRE

1972 Ford D2DIF 9.39 Litre V-8 GVW 9979 KG Project 11-4133

Test	EMPTY LOAD - 5216 KG					HALF LOAD - 7258 KG					FULL LOAD - 9072 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	15.05	16.2	1360	15.08	53.3	17.26	19.0	1531	15.38	60.1	17.74	18.1	1439	15.49	56.6
10 SS	10.96	10.9	936	8.79	36.7	11.57	12.4	925	8.96	36.5	12.47	12.9	937	9.76	37.1
15 SS	10.13	10.8	879	7.39	34.5	10.91	8.2	922	8.25	36.0	11.38	11.3	910	8.64	35.8
20 SS	7.63	8.3	683	5.64	26.8	8.32	8.4	719	6.42	28.2	8.33	8.3	721	6.85	28.3
30 SS	4.29	5.0	501	4.52	19.4	4.59	5.1	514	5.00	20.0	4.64	4.8	533	5.91	20.6
40 SS	3.92	4.4	653	5.48	25.0	4.02	4.6	676	6.56	25.9	4.15	4.5	714	7.55	27.3
55 SS	3.41	2.5	660	6.57	25.1	3.68	2.5	714	7.94	27.1	3.81	2.5	770	9.71	29.2
20±5	6.24	6.4	847	7.68	32.6	6.85	7.4	1029	7.73	39.5	5.77	6.4	1195	10.40	45.5
30±5	4.29	4.2	553	5.61	21.3	4.10	3.8	625	5.84	24.0	4.08	4.9	740	7.26	28.3
40±2	4.58	5.4	685	6.69	26.3	5.09	5.7	721	6.80	27.7	4.91	5.1	800	6.98	30.6
05 AVG.	10.24	15.0	1190	10.25	46.3	11.77	12.3	1224	10.77	47.6	10.89	15.4	1378	13.45	53.4
10 AVG.	7.81	10.5	905	8.02	35.2	9.18	9.9	1023	9.10	39.7	7.46	9.9	1059	10.11	40.8
15 AVG.	5.69	7.1	750	6.63	29.0	6.26	7.5	883	8.06	34.0	5.65	7.3	925	9.37	35.5
20 AVG.	4.90	6.0	784	7.02	30.1	5.38	8.5	990	9.03	37.9	4.39	8.8	971	9.96	37.2

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed

XX ±Y - Sinusoidal with designated average speed and amplitude

XX AVG. - Driving Cycle with designated average speed

APPENDIX D-1 (Cont'd.)

TABLE 19-2. TRUCK 019 SUMMARY - GRAMS/MINUTE

1972 Ford D2DIE 9.39 Litre V-8 GVW 9979 KG Project 11-4133

Test	EMPTY LOAD - 5216 KG					HALF LOAD - 7258 KG					FULL LOAD - 9072 KG				
Dest.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.66	0.8	60	0.91	19.78	0.60	0.9	59	0.80	19.55	0.61	0.8	56	0.78	18.42
05 SS	2.06	2.2	186	2.06	61.41	2.36	2.6	209	2.10	69.23	2.43	2.5	197	2.12	65.30
10 SS	3.00	3.0	256	2.40	84.66	3.16	3.4	253	2.45	84.08	3.41	3.5	256	2.67	85.43
15 SS	4.16	4.4	361	3.03	119.36	4.48	3.4	378	3.39	124.57	4.67	4.6	374	3.55	123.95
20 SS	4.17	4.5	374	3.09	123.44	4.55	4.6	393	3.51	130.05	4.56	4.5	395	3.75	130.38
30 SS	3.55	4.2	415	3.75	135.72	3.81	4.2	426	4.15	139.38	3.85	4.0	441	4.89	144.04
40 SS	4.29	4.9	715	6.00	230.58	4.40	5.0	739	7.18	238.50	4.55	4.9	781	8.26	251.61
55 SS	5.11	3.7	988	9.83	316.42	5.50	3.7	1068	11.88	342.06	5.71	3.7	1153	14.53	368.81
20±5	3.54	3.6	480	4.35	155.68	3.65	3.9	549	4.12	177.48	2.96	3.3	614	5.34	196.84
30±5	3.57	3.5	460	4.67	149.48	3.30	3.0	503	4.69	162.35	3.22	3.9	584	5.73	188.01
40±2	5.12	6.0	765	7.46	247.84	5.51	6.2	781	7.36	253.29	5.22	5.4	851	7.43	274.68
05 AVG.	1.59	2.3	184	1.59	60.50	1.90	2.0	197	1.74	64.68	1.63	2.3	206	2.01	67.40
10 AVG.	2.08	2.8	241	2.13	78.86	2.50	2.7	278	2.48	91.08	1.97	2.6	280	2.67	90.91
15 AVG.	2.27	2.8	299	2.64	97.20	2.58	3.1	364	3.32	118.01	2.22	2.9	363	3.58	117.37
20 AVG.	2.57	3.2	412	3.69	133.14	2.83	4.5	521	4.75	168.40	2.31	4.6	512	5.25	164.94
13-FTP						3.48	6.38	729	6.22	224.10					
13-FTP						3.46	6.32	742	6.11	223.30					

*Fuel Consumption in Grams/Minute

13-FTP - 13-Mode Federal Test Procedure

APPENDIX D-1 (Cont'd.)

TABLE 19-3. TRUCK 019 SUMMARY - GRAMS/KILOGRAM OF FUEL

1972 Ford D2DIE 9.39 Litre V-8 GVW 9979 KG Project 11-4133

Test	EMPTY LOAD - 5216 KG				HALF LOAD - 7258 KG				FULL LOAD - 9072 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	33.23	40.2	3023	45.99	30.92	43.9	3024	40.88	33.15	45.7	3015	42.19
05 SS	33.52	36.0	3029	33.59	34.10	37.5	3024	30.38	37.15	37.8	3014	32.44
10 SS	35.41	35.3	3024	28.39	37.64	40.3	3009	29.14	39.92	41.4	3000	31.26
15 SS	34.82	37.2	3023	25.41	35.93	26.9	3035	27.18	37.66	37.4	3013	28.60
20 SS	33.81	36.8	3026	25.01	35.00	35.3	3025	27.02	34.96	34.6	3026	28.76
30 SS	26.18	30.7	3060	27.60	27.31	30.1	3057	29.75	26.69	27.5	3063	33.98
40 SS	18.58	21.1	3099	26.01	18.45	21.1	3099	30.08	18.07	19.6	3103	32.82
55 SS	16.15	11.8	3121	31.06	16.09	10.9	3123	34.73	15.48	10.1	3126	39.40
20±5	22.73	23.3	3082	27.97	20.57	22.2	3091	23.22	15.05	16.7	3117	27.10
30±5	23.89	23.2	3079	31.22	20.33	18.7	3097	28.92	17.14	20.5	3104	30.48
40±2	20.65	24.1	3088	30.11	21.77	24.3	3084	29.08	19.02	19.6	3100	27.05
05 AVG.	26.23	38.5	3048	26.26	29.34	30.6	3050	26.85	24.18	34.2	3061	29.87
10 AVG.	26.34	35.5	3052	27.04	27.43	29.7	3057	27.19	21.68	28.9	3077	29.38
15 AVG.	23.31	29.2	3071	27.15	21.83	26.3	3080	28.13	18.88	24.3	3093	31.32
20 AVG.	19.31	23.8	3092	27.69	16.82	26.7	3095	28.23	14.02	28.0	3102	31.81

APPENDIX D-1 (Cont'd.)

TABLE 19-4. TRUCK 019 SUMMARY - OPERATING DATA
1972 Ford D2DIE 9.39 Litre V-8 GVW 9979 KG Project 11-4133

Test Desc.	EMPTY LOAD - 5216 KG Test No.	RPM	Rack, %	HALF LOAD - 7258 KG Test No.	RPM	Rack, %	FULL LOAD - 9072 KG Test No.	RPM	Rack, %
00 SS	71	680	0.0	41	680	0.0	11	680	0.0
05 SS	72	1730	33.9	42	1750	33.3	12	1722	33.3
10 SS	73	1920	35.7	43	1915	35.1	13	1925	35.1
15 SS	74	2300	39.4	44	2330	40.1	14	2315	38.9
20 SS	75	2250	39.4	45	2276	40.1	15	2240	39.4
30 SS	76	2060	41.3	46	2063	41.3	16	2065	41.8
40 SS	77	2725	70.8	47	2739	72.0	17	2741	73.3
55 SS	78	2625	71.5	48	2640	72.7	18	2645	75.1
		Period			Period			Period	
20±5	81	13.0		51	13.0		21	13.0	
30±5	82	24.0		52	24.0		22	24.0	
40±2	86	38.0		56	38.0		26	38.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX D-2

TABLE 20-1. TRUCK 020 SUMMARY - GRAMS/KILOMETRE

1975 Ford Cal. TTDIE 14.01 Litre I-6 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	5.53	9.7	2620	15.95	98.6	4.74	7.8	2620	13.69	98.5	4.53	6.7	2591	15.82	97.3
10 SS	2.97	5.3	1557	9.47	58.6	2.58	3.8	1646	8.62	61.8	2.51	4.2	1628	9.97	61.1
15 SS	2.47	4.5	1357	7.69	51.0	1.95	3.8	1442	7.45	54.1	1.91	2.5	1440	8.43	53.9
20 SS	1.77	3.6	1074	6.84	40.4	1.29	3.0	1125	6.37	42.2	1.36	3.0	1143	7.28	42.9
30 SS	1.25	2.9	973	7.37	36.5	0.99	2.0	1157	7.98	43.2	1.04	2.3	1292	10.36	48.3
40 SS	0.87	2.3	1026	9.91	38.4	0.67	1.5	1135	10.88	42.4	0.73	1.7	1336	14.52	49.9
55 SS	0.69	2.1	1187	16.58	44.4	0.64	1.8	1499	25.64	55.9	0.86	3.1	1742	33.02	65.1
20±5	1.46	4.7	1155	9.71	43.4	2.09	4.1	1569	15.47	58.8	2.44	11.3	1861	22.24	70.2
30±5	1.27	3.0	970	8.25	36.4	1.45	2.2	1068	10.08	40.0	1.94	4.3	1352	17.87	50.8
40±2	0.69	2.0	946	8.57	35.4	0.63	1.5	1083	10.75	40.5	0.69	2.5	1304	15.29	48.7
05 AVG.	3.98	7.7	2006	16.15	75.5	4.07	9.5	2287	23.71	86.1	3.89	12.5	2694	26.17	101.4
10 AVG.	2.50	6.1	1616	13.03	60.8	2.65	7.8	1975	20.68	74.2	2.42	9.5	2331	25.54	87.5
15 AVG.	2.01	5.8	1407	11.69	52.9	2.35	8.3	1785	19.02	67.2	2.19	11.8	2236	25.04	84.1
20 AVG.	1.50	3.9	1292	12.21	48.5	1.40	5.2	1671	20.33	62.6	1.52	6.7	1987	25.39	74.5

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX D-2 (Cont'd.)

TABLE 20-2. TRUCK 020 SUMMARY - GRAMS/MINUTE

1975 Ford Cal. TIDIE 14.01 Litre I-6 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.30	0.5	107	0.82	34.03	0.27	0.3	92	0.61	29.37	0.26	0.3	89	0.69	28.15
05 SS	0.80	1.4	379	2.31	120.40	0.69	1.1	379	1.98	120.16	0.66	1.0	375	2.29	118.73
10 SS	0.79	1.4	413	2.51	131.03	0.73	1.1	464	2.43	146.56	0.71	1.2	458	2.81	144.99
15 SS	0.99	1.8	546	3.09	173.04	0.78	1.5	580	3.00	183.33	0.77	1.0	579	3.39	182.79
20 SS	0.95	1.9	579	3.69	183.37	0.69	1.6	606	3.44	191.52	0.73	1.6	616	3.92	194.71
30 SS	1.03	2.4	799	6.05	252.58	0.81	1.6	949	6.55	299.12	0.86	1.9	1060	8.50	334.20
40 SS	0.94	2.4	1106	10.68	348.86	0.72	1.6	1215	11.65	382.26	0.79	1.8	1451	15.77	456.45
55 SS	1.01	3.2	1748	24.41	550.38	0.93	2.6	2171	37.12	682.70	1.25	4.6	2537	48.08	798.64
20±5	0.80	2.6	631	5.30	199.86	1.16	2.3	874	8.61	276.12	1.33	6.2	1015	12.13	322.37
30±5	1.04	2.4	791	6.73	250.16	1.17	1.8	867	8.18	273.82	1.58	3.5	1103	14.57	349.02
40±2	0.75	2.2	1031	9.34	324.98	0.67	1.6	1150	11.40	361.83	0.76	2.8	1435	16.83	452.02
05 AVG.	0.59	1.1	295	2.38	93.76	0.61	1.4	344	3.57	109.22	0.56	1.8	388	3.77	123.16
10 AVG.	0.73	1.8	470	3.79	148.97	0.76	2.2	563	5.90	178.40	0.66	2.6	637	6.98	201.74
15 AVG.	0.86	2.5	601	4.99	190.50	0.95	3.4	720	7.67	228.21	0.85	4.6	871	9.75	276.02
20 AVG.	0.81	2.1	698	6.60	220.77	0.76	2.8	898	10.93	283.73	0.79	3.5	1033	13.20	326.20
13-FTP						0.96	5.5	1391	23.85	432.76					
13-FTP						0.85	4.6	1361	24.90	432.76					

*Fuel Consumption in Grams/Minute

13-FTP - 13-Mode Federal Test Procedure

APPENDIX D-2 (Cont'd.)

TABLE 20-3. TRUCK 020 SUMMARY - GRAMS/KILOGRAM OF FUEL

1975 Ford Cal. TTDIE 14.01 Litre I-6 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG				HALF LOAD - 22226 KG				FULL LOAD - 33340 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	8.72	16.1	3137	24.08	9.10	10.5	3145	20.73	9.24	9.1	3147	24.45
05 SS	6.65	11.7	3151	19.18	5.71	9.4	3157	16.49	5.52	8.2	3160	19.29
10 SS	6.03	10.7	3154	19.18	4.96	7.2	3163	16.56	4.88	8.3	3162	19.36
15 SS	5.74	10.5	3156	17.87	4.28	8.4	3163	16.34	4.20	5.5	3168	18.54
20 SS	5.19	10.6	3157	20.11	3.63	8.5	3165	17.94	3.77	8.4	3165	20.15
30 SS	4.08	9.5	3162	23.94	2.72	5.4	3173	21.89	2.56	5.7	3173	25.43
40 SS	2.69	7.0	3171	30.62	1.88	4.3	3177	30.47	1.74	4.0	3178	34.56
55 SS	1.84	5.7	3175	44.36	1.36	3.8	3180	54.38	1.56	5.7	3176	60.20
20±5	4.00	12.8	3157	26.54	4.21	8.3	3164	31.20	4.13	19.1	3147	37.62
30±5	4.15	9.7	3162	26.89	4.29	6.4	3167	29.88	4.54	10.1	3160	41.75
40±2	2.30	6.7	3172	28.74	1.86	4.5	3177	31.52	1.68	6.1	3175	37.24
05 AVG.	6.25	12.2	3151	25.37	5.62	13.1	3152	32.69	4.55	14.7	3153	30.63
10 AVG.	4.88	11.9	3156	25.44	4.23	12.5	3157	33.06	3.28	12.9	3159	34.61
15 AVG.	4.50	13.1	3155	26.21	4.15	14.7	3154	33.60	3.10	16.6	3154	35.32
20 AVG.	3.67	9.5	3164	29.90	2.66	9.9	3166	38.52	2.41	10.7	3166	40.45

APPENDIX D-2 (Cont'd.)

TABLE 20-4. TRUCK 020 SUMMARY - OPERATING DATA

1975 Ford Cal. TTDIE 14.01 Litre I-6 GVW 34700 KG Project 11-4133

	EMPTY LOAD - 11113 KG			HALF LOAD - 22226 KG			FULL LOAD - 33340 KG		
Test Desc.	Test No.	RPM	Rail, psi	Test No.	RPM	Rail, psi	Test No.	RPM	Rail, psi
00 SS	71	670	0	41	650	0	11	670	0
05 SS	72	1577	9	42	1550	7	12	1500	6
10 SS	73	1550	8	43	1625	10	13	1600	10
15 SS	74	1750	13	44	1750	12	14	1750	12
20 SS	75	1670	13	45	1700	14	15	1700	14
30 SS	76	1919	24	46	1900	24	16	1950	30
40 SS	77	1850	30	47	1850	36	17	1850	42
55 SS	78	1908	60	48	1880	78	18	1885	97
		Period			Period			Period	
20±5	81	27.0		51	27.0		21	27.0	
30±5	82	44.0		52	44.0		22	44.0	
40±2	86	60.0		56	60.0		26	60.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX D-3

TABLE 21-1. TRUCK 021 SUMMARY - GRAMS/KILOMETRE
1973 IHC TTDIE 14.01 Litre I-6 GVW 34474 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	2.78	19.6	2712	21.37	102.3	3.16	14.6	2879	22.83	108.3	2.72	15.3	2514	20.15	94.7
10 SS	2.14	14.9	2511	18.97	94.5	2.33	12.6	2828	22.62	106.2	1.94	14.8	2682	19.77	100.8
15 SS	1.03	7.6	1407	11.10	52.9	1.06	5.8	1486	12.48	55.7	0.73	6.4	1422	11.06	53.3
20 SS	0.87	7.0	1344	11.08	50.5	0.93	5.1	1423	10.71	53.3	0.69	5.7	1406	11.90	52.7
30 SS	0.72	5.6	1281	11.49	48.0	0.73	4.4	1384	13.97	51.8	0.52	5.3	1392	13.50	52.1
40 SS	0.55	4.6	1194	12.58	44.8	0.61	4.0	1303	15.96	48.8	0.39	4.6	1424	17.65	53.3
55 SS	0.37	5.0	1109	17.59	41.6	0.37	10.3	1437	29.10	54.1	0.27	13.2	1648	36.55	62.1
20±5	1.33	6.0	1509	15.33	56.6	2.37	10.3	1706	20.25	64.3	2.74	21.6	2068	28.90	78.5
30±5	0.57	3.3	1093	12.40	40.9	1.08	7.2	1200	16.66	45.2	1.14	15.4	1505	23.81	57.0
40±2	0.53	3.4	1229	14.62	46.0	0.53	4.4	1341	18.04	50.2	0.54	5.3	1517	19.76	56.8
05 AVG.	3.65	20.1	2136	21.75	81.1	3.54	25.6	2402	26.48	91.3	4.40	30.3	3134	36.78	118.8
10 AVG.	2.27	15.9	1749	18.37	66.2	2.35	22.8	2192	26.41	83.1	2.66	27.0	2642	32.59	100.1
15 AVG.	1.81	15.0	1592	17.51	60.3	1.80	20.2	1898	23.23	72.0	1.97	24.1	2328	38.86	88.2
20 AVG.	1.26	11.9	1455	17.67	55.0	1.17	17.5	1808	25.02	68.4	1.39	20.2	2269	34.00	85.7

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX D-3 (Cont'd.)

TABLE 21-2. TRUCK 021 SUMMARY - GRAMS/MINUTE

1973 IHC TTDIE 14.01 Litre I-6 GVW 34474 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.30	0.9	99	0.85	31.94	0.30	0.8	108	0.91	34.55	0.29	0.8	101	0.83	32.20
05 SS	0.38	2.7	371	2.92	117.96	0.43	2.0	394	3.12	124.83	0.37	2.1	344	2.76	109.19
10 SS	0.57	4.0	667	5.04	211.44	0.62	3.3	751	6.01	237.60	0.52	3.9	712	5.25	255.64
15 SS	0.42	3.1	566	4.46	179.39	0.43	2.3	598	5.02	188.96	0.29	2.6	572	4.45	180.81
20 SS	0.47	3.8	724	5.97	229.42	0.50	2.8	767	5.78	242.28	0.37	3.1	758	6.41	239.46
30 SS	0.58	4.5	1030	9.24	325.79	0.59	3.5	1113	11.24	351.31	0.42	4.3	1120	10.86	353.47
40 SS	0.59	5.0	1278	13.46	403.64	0.65	4.3	1394	17.08	439.75	0.42	4.9	1524	18.88	480.44
55 SS	0.55	7.3	1632	25.90	515.84	0.55	15.2	2116	42.85	671.31	0.40	19.4	2426	53.81	770.46
20±5	0.73	3.3	826	8.39	261.23	1.21	5.4	893	10.60	283.87	1.30	10.2	980	13.69	313.48
30±5	0.47	2.7	891	10.11	281.13	0.85	5.7	951	13.20	301.74	0.84	11.3	1107	17.52	353.53
40±2	0.58	3.7	1328	15.80	418.77	0.55	4.6	1411	18.98	444.99	0.55	5.3	1522	19.82	480.35
05 AVG.	0.54	3.0	313	3.19	100.10	0.50	3.6	342	3.77	109.59	0.60	4.1	428	5.03	136.92
10 AVG.	0.64	4.5	495	5.20	157.91	0.63	6.2	591	7.12	189.03	0.72	7.3	711	8.77	227.12
15 AVG.	0.74	6.1	648	7.12	206.79	0.70	7.9	741	9.07	236.94	0.77	9.4	906	15.12	289.38
20 AVG.	0.66	6.2	762	9.25	242.50	0.60	9.0	930	12.86	296.43	0.70	10.2	1149	17.21	365.79
13-FTP						0.47	6.8	1220	20.24	377.12					
13-FTP						0.44	7.1	1228	20.38	377.12					
13-FTP						0.50	7.5	1180	21.00	379.53					

*Fuel Consumption in Grams/Minute

13-FTP - 13-Mode Federal Test Procedure

APPENDIX D-3 (Cont'd.)

TABLE 21-3. TRUCK 021 SUMMARY - GRAMS/KILOGRAM OF FUEL
1973 IHC TTDIE 14.01 Litre I-6 GVW 34474 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG				HALF LOAD - 22226 KG				FULL LOAD - 33340 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	9.31	29.0	3115	26.50	8.59	24.4	3125	26.41	9.07	25.1	3122	25.76
05 SS	3.22	22.7	3144	24.78	3.46	16.0	3154	25.01	3.41	19.2	3149	25.24
10 SS	2.69	18.7	3152	23.82	2.61	14.1	3160	25.28	2.29	17.4	3156	23.26
15 SS	2.32	17.1	3156	24.88	2.25	12.4	3164	26.57	1.63	14.3	3163	24.60
20 SS	2.05	16.4	3158	26.03	2.07	11.4	3166	23.84	1.55	12.8	3165	26.78
30 SS	1.78	13.9	3163	28.36	1.67	10.1	3169	31.98	1.19	12.0	3167	30.72
40 SS	1.45	12.3	3166	33.35	1.49	9.7	3170	38.84	0.88	10.2	3171	39.30
55 SS	1.06	14.2	3164	50.20	0.82	22.6	3152	63.83	0.51	25.2	3149	69.84
20±5	2.78	12.6	3162	32.11	4.27	19.0	3147	37.36	4.15	32.6	3126	43.67
30±5	1.65	9.6	3170	35.96	2.83	18.9	3151	43.74	2.38	32.0	3132	49.55
40±2	1.38	8.9	3172	37.73	1.25	10.4	3170	42.64	1.14	11.1	3169	41.27
05 AVG.	5.35	29.5	3127	31.83	4.61	33.3	3123	34.43	4.40	30.2	3129	36.72
10 AVG.	4.07	28.5	3133	32.91	3.36	32.6	3128	37.69	3.15	32.0	3130	38.62
15 AVG.	3.57	29.5	3133	34.45	2.96	33.3	3128	38.28	2.64	32.4	3131	52.25
20 AVG.	2.72	25.6	3141	38.16	2.03	30.4	3136	43.40	1.92	28.0	3140	47.04

APPENDIX D-3 (Cont'd.)

TABLE 21-4. TRUCK 021 SUMMARY - OPERATING DATA

1973 IHC TTDIE 14.01 Litre I-6 GVW 34474 KG Project 11-4133

	EMPTY LOAD - 11113 KG			HALF LOAD - 22226 KG			FULL LOAD - 33340 KG		
Test Desc.	Test No.	RPM	Rail, psi	Test No.	RPM	Rail, psi	Test No.	RPM	Rail, psi
00 SS	71	670	0.0	41	666	0.0	11	670	0.0
05 SS	72	1462	7.0	42	1400	7.0	12	1420	7.0
10 SS	73	1880	14.0	43	1916	16.0	13	1911	16.0
15 SS	74	1600	12.0	44	1638	12.0	14	1600	12.0
20 SS	75	1786	17.0	45	1800	18.0	15	1802	18.0
30 SS	76	1950	27.0	46	1968	32.0	16	1944	32.0
40 SS	77	1960	38.0	47	1938	46.0	17	1970	54.0
55 SS	78	1710	64.0	48	1725	94.0	18	1730	122.0
		Period			Period			Period	
20±5	81	34.0		51	34.0		21	34.0	
30±5	82	51.0		52	51.0		22	51.0	
40±2	86	96.0		56	96.0		26	96.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX D-4

TABLE 22-1. TRUCK 022 SUMMARY - GRAMS/KILOMETRE

1971 Mack TTDIE 11.01 Litre I-6 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NOx	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	7.27	17.7	914	21.97	35.9	5.88	10.1	843	20.09	32.6	6.08	12.4	837	18.97	32.6
10 SS	13.44	16.6	1875	20.75	72.3	12.67	11.9	1787	21.06	68.6	12.40	12.8	1759	20.99	67.6
15 SS	6.58	8.9	1046	16.71	40.2	6.47	5.9	1047	17.11	40.0	6.43	5.8	1057	16.62	40.4
20 SS	7.47	7.9	1217	13.26	46.6	7.42	5.7	1291	13.34	49.2	7.59	6.2	1310	13.29	50.0
30 SS	3.25	3.3	723	10.28	27.5	3.26	2.4	794	11.35	30.0	3.29	2.6	843	11.68	31.9
40 SS	2.42	1.8	781	17.27	29.4	2.51	4.1	951	21.07	35.9	2.38	10.7	1124	25.83	42.7
55 SS	1.67	16.0	1123	16.70	42.9	0.94	11.7	1493	26.04	56.3	0.59	15.1	1540	28.71	58.2
20±5	6.20	9.4	1263	13.20	48.3	5.07	17.7	1491	16.18	57.1	4.73	23.7	1966	22.39	75.1
30±5	3.80	4.4	852	12.23	32.4	3.73	11.3	1040	15.53	39.8	2.12	13.9	1205	17.91	45.9
40±2	2.20	1.4	723	15.87	27.2	2.33	6.8	967	23.13	36.6	1.69	12.2	1087	26.30	41.3
05 AVG.	10.27	37.1	1841	27.57	71.8	9.02	50.2	2015	31.23	78.9	9.03	65.8	2774	42.12	108.1
10 AVG.	5.81	29.4	1398	19.83	54.4	5.23	39.6	1727	26.58	67.2	4.97	46.7	2221	31.43	85.9
15 AVG.	4.39	23.6	1286	19.09	49.7	3.71	32.7	1515	22.86	58.7	3.49	39.8	2006	29.16	77.4
20 AVG.	3.41	19.1	1288	19.45	49.4	2.60	26.4	1560	24.32	59.9	2.53	36.2	1907	29.03	73.3

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX D-4 (Cont'd.)

TABLE 22-2. TRUCK 022 SUMMARY - GRAMS/MINUTE

1971 Mack TTDIE 11.01 Litre I-6 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	1.23	4.5	95	1.35	33.35	0.96	3.0	95	1.55	32.06	0.95	3.0	94	1.51	31.87
05 SS	1.05	2.6	132	3.18	43.79	0.90	1.5	129	3.07	42.01	0.93	1.9	128	2.90	41.95
10 SS	3.78	4.7	528	5.84	171.56	3.47	3.3	489	5.76	158.24	3.29	3.4	467	5.57	151.26
15 SS	2.65	3.6	421	6.72	136.20	2.65	2.4	429	7.02	138.39	2.64	2.4	434	6.82	139.69
20 SS	3.79	4.0	617	6.72	198.99	3.88	3.0	675	6.98	216.94	3.97	3.3	685	6.95	220.30
30 SS	3.27	3.3	727	10.34	232.77	3.28	2.4	798	11.41	254.55	3.28	2.6	841	11.66	268.05
40 SS	2.58	2.0	835	18.48	265.39	2.70	4.4	1025	22.71	326.11	2.55	11.5	1202	27.64	385.03
55 SS	2.44	23.3	1636	24.31	526.69	1.37	17.0	2174	37.91	691.06	0.78	20.1	2056	38.34	655.24
20±5	3.33	5.1	678	7.09	218.40	2.68	9.3	788	8.55	254.17	2.43	12.2	1011	11.52	325.44
30±5	3.03	3.5	679	9.74	217.46	2.97	9.0	829	12.38	267.12	1.69	11.1	963	14.31	308.97
40±2	2.38	1.5	780	17.13	247.67	2.50	7.3	1038	24.83	331.41	1.81	13.1	1168	28.24	374.24
05 AVG.	1.40	5.1	251	3.76	82.58	1.24	6.9	277	4.30	91.61	1.23	8.9	377	5.72	123.67
10 AVG.	1.62	8.2	389	5.52	127.55	1.40	10.6	463	7.12	151.66	1.31	12.3	584	8.27	190.42
15 AVG.	1.75	9.4	513	7.61	167.15	1.43	12.6	584	8.81	190.73	1.30	14.8	747	10.86	242.83
20 AVG.	1.74	9.8	660	9.96	213.27	1.33	13.5	796	12.42	257.56	1.21	17.3	913	13.89	295.78
13-FTP						2.29	11.10	899	13.72	293.96					
13-FTP						2.25	10.10	893	13.52	294.57					

*Fuel Consumption in Grams/Minute

13-FTP - 13-Mode Federal Test Procedure

APPENDIX D-4 (Cont'd.)

TABLE 22-3. TRUCK 022 SUMMARY - GRAMS/KILOGRAM OF FUEL
1971 Mack TTDIE 11.01 Litre I-6 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG				HALF LOAD - 22226 KG				FULL LOAD - 33340 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	36.80	135.1	2863	40.56	29.94	92.2	2951	48.33	29.92	93.6	2949	47.32
05 SS	24.05	58.6	3023	72.65	21.41	36.8	3065	73.11	22.15	45.0	3050	69.11
10 SS	22.06	27.2	3078	34.06	21.90	20.6	3089	36.40	21.76	22.5	3087	36.84
15 SS	19.44	26.3	3088	49.36	19.18	17.4	3103	50.72	18.88	17.1	3104	48.81
20 SS	19.03	20.2	3099	33.78	17.89	13.8	3112	32.16	18.01	14.8	3110	31.54
30 SS	14.04	14.3	3124	44.43	12.87	9.4	3135	44.83	12.24	9.8	3136	43.49
40 SS	9.74	7.5	3148	69.64	8.29	13.4	3143	69.65	6.62	29.7	3123	71.78
55 SS	4.63	44.3	3106	46.17	1.99	24.6	3145	54.86	1.20	30.7	3138	58.52
20±5	15.25	23.2	3106	32.46	10.54	36.7	3099	33.62	7.47	37.4	3108	35.39
30±5	13.91	16.3	3121	44.77	11.13	33.8	3102	46.35	5.49	36.1	3116	46.32
40±2	9.60	6.0	3151	69.15	7.56	22.1	3132	74.93	4.84	34.9	3120	75.46
05 AVG.	16.96	61.2	3041	45.54	13.56	75.5	3029	46.94	9.91	72.3	3046	46.23
10 AVG.	12.67	64.1	3050	43.26	9.23	69.9	3051	46.96	6.86	64.4	3067	43.40
15 AVG.	10.48	56.2	3069	45.53	7.49	66.1	3063	46.21	5.36	61.0	3077	44.73
20 AVG.	8.16	45.9	3092	46.70	5.16	52.4	3092	48.21	4.10	58.5	3085	46.96

APPENDIX D-4 (Cont'd.)

TABLE 22-4. TRUCK 022 SUMMARY - OPERATING DATA
1971 Mack TTDIE 11.01 Litre I-6 GVW 34700 KG Project 11-4133

	EMPTY LOAD - 11113 KG			HALF LOAD - 22226 KG			FULL LOAD - 33340 KG		
Test Desc.	Test No.	RPM	Rack, %	Test No.	RPM	Rack, %	Test No.	RPM	Rack, %
00 SS	71	625	0.0	41	613	0.0	11	620	0.0
05 SS	72	574	0.0	42	570	0.0	12	564	0.0
10 SS	73	1749	35.5	43	1699	31.6	13	1670	30.0
15 SS	74	1466	16.7	44	1450	18.9	14	1455	18.9
20 SS	75	1820	38.9	45	1850	48.3	15	1850	48.8
30 SS	76	1680	33.3	46	1700	36.1	16	1685	36.1
40 SS	77	1380	20.5	47	1377	23.3	17	1375	26.6
55 SS	78	1860	55.5	48	1895	100.0	18	1731	100.0
		Period			Period			Period	
20±5	81	36.0		51	36.0		21	36.0	
30±5	82	72.0		52	72.0		22	72.0	
40±2	86	216.0		56	216.0		26	216.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX D-5

TABLE 23-1. TRUCK 023 SUMMARY - GRAMS/KILOMETRE
1972 IHC TTDIE 9.31 Litre V-8 GVW 34700 KG Project 11-4133

Test Desc.	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	8.69	34.0	2910	61.87	111.2	10.02	40.0	3058	68.11	117.2	12.11	44.5	3933	79.02	150.3
10 SS	4.83	13.1	1819	42.70	69.0	5.13	13.1	1819	39.81	69.0	5.35	13.3	1944	42.48	73.7
15 SS	3.92	9.0	1540	38.16	58.3	4.34	7.1	1611	36.44	60.8	4.16	7.9	1712	39.05	64.6
20 SS	2.87	6.1	1184	32.23	44.7	2.99	4.0	1251	32.11	47.1	2.89	5.1	1278	33.10	48.2
30 SS	2.19	3.6	1088	33.35	40.9	2.29	2.2	1177	34.33	44.2	2.23	3.7	1250	36.16	47.0
40 SS	1.69	1.9	1025	35.83	38.4	1.71	1.1	1226	44.54	45.9	1.66	1.4	1302	47.45	48.7
55 SS	1.43	1.2	1187	48.40	44.4	1.64	3.6	1456	59.78	54.6	2.01	13.8	1630	58.98	61.7
20±5	-	-	-	-	-	2.13	3.7	1464	51.69	54.9	2.49	30.8	1854	57.97	71.0
30±5	-	-	-	-	-	2.11	3.5	1237	44.76	46.5	2.14	22.5	1448	47.21	55.4
40±2	-	-	-	-	-	1.74	1.1	1167	44.87	43.7	1.77	2.4	1296	53.14	48.6
05 AVG.	6.10	30.2	2298	62.85	87.9	5.47	23.6	2283	65.88	86.9	6.28	39.0	2714	86.05	104.0
10 AVG.	3.59	13.7	1738	51.27	65.8	3.92	24.3	1974	59.00	75.3	3.78	30.0	2207	70.61	84.3
15 AVG.	2.91	14.3	1533	45.15	58.2	2.93	23.2	1738	51.60	66.3	2.84	32.0	2027	64.82	77.6
20 AVG.	2.31	8.2	1316	42.83	49.7	2.48	21.9	1676	52.13	63.9	2.01	30.0	1895	60.11	72.5

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX D-5 (Cont'd.)

TABLE 23-2. TRUCK 023 SUMMARY - GRAMS/MINUTE

1972 IHC TTDIE 9.31 Litre V-8 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.38	1.4	94	1.90	30.49	0.42	1.6	93	1.69	30.28	0.43	1.6	97	1.85	31.58
05 SS	1.12	4.4	375	7.96	120.66	1.21	4.8	369	8.22	119.23	1.27	4.7	411	8.26	132.48
10 SS	1.28	3.5	483	11.34	154.32	1.36	3.5	483	10.57	154.42	1.42	3.5	516	11.28	164.94
15 SS	1.55	3.6	607	15.04	193.59	1.71	2.8	635	14.37	202.15	1.64	3.1	675	15.39	214.66
20 SS	1.48	3.1	610	16.60	194.17	1.59	2.1	664	17.05	210.86	1.53	2.7	679	17.58	215.60
30 SS	1.74	2.9	866	26.56	274.74	1.82	1.8	937	27.34	296.49	1.78	2.9	996	28.80	315.37
40 SS	1.79	2.0	1088	38.04	343.92	1.83	1.2	1312	47.66	413.56	1.77	1.4	1383	50.39	435.94
55 SS	2.07	1.8	1719	70.08	541.75	2.38	5.3	2121	87.04	669.67	2.91	19.9	2360	85.41	752.51
20±5	0.99	4.0	668	17.04	212.19	1.16	2.0	795	28.09	251.45	1.33	16.5	992	31.02	320.43
30±5	1.19	3.6	919	24.05	290.89	1.71	2.8	1005	36.35	317.99	1.71	17.9	1154	37.62	372.22
40±2	1.47	4.9	-	42.55	-	1.91	1.2	1278	49.13	402.97	1.90	2.6	1394	57.15	440.10
05 AVG.	0.82	4.1	310	8.48	100.04	0.78	3.4	326	9.41	104.64	0.88	5.5	379	12.02	122.42
10 AVG.	0.95	3.6	461	13.59	147.14	1.06	6.6	536	16.01	172.22	1.02	8.1	596	19.07	191.87
15 AVG.	1.11	5.5	587	17.29	187.85	1.15	9.1	680	20.20	218.90	1.10	12.3	783	25.04	252.65
20 AVG.	1.25	4.4	711	23.15	226.45	1.29	11.4	870	27.06	279.53	1.03	15.4	975	30.93	314.35
13-FTP						1.73	16.17	1111	38.73	369.86					
13-FTP						1.63	14.53	1100	38.33	369.86					

*Fuel Consumption in Grams/Minute

13-FTP - 13-Mode Federal Test Procedure

APPENDIX D-5 (Cont'd.)

TABLE 23-3. TRUCK 023 SUMMARY - GRAMS/KILOGRAM OF FUEL
1972 IHC TTDIE 9.31 Litre V-8 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG				HALF LOAD - 22226 KG				FULL LOAD - 33340 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	12.37	45.6	3080	62.34	13.91	52.0	3065	55.82	13.77	50.1	3068	58.68
05 SS	9.27	36.2	3104	66.01	10.15	40.4	3095	68.94	9.56	35.1	3105	62.38
10 SS	8.31	22.6	3129	73.46	8.82	22.6	3127	68.44	8.61	21.4	3130	68.37
15 SS	7.98	18.4	3136	77.71	8.47	13.8	3142	71.06	7.65	14.4	3143	71.71
20 SS	7.61	16.1	3141	85.47	7.52	10.0	3151	80.86	7.11	12.5	3148	81.53
30 SS	6.33	10.5	3154	96.69	6.14	5.9	3162	92.22	5.64	9.3	3158	91.31
40 SS	5.21	5.9	3165	110.62	4.43	2.8	3172	115.24	4.05	3.3	3172	115.60
55 SS	3.81	3.3	3173	129.37	3.56	7.9	3167	129.98	3.87	26.5	3136	113.51
20±5	4.65	18.7	3146	80.32	4.60	7.9	3163	111.71	4.16	51.4	3096	96.80
30±5	4.10	12.3	3158	82.66	5.38	8.8	3159	114.29	4.59	48.1	3100	101.08
40±2	-	-	-	-	4.74	3.0	3171	121.91	4.32	6.0	3167	129.87
05 AVG.	8.23	40.8	3100	84.79	7.74	32.2	3116	89.92	7.17	44.6	3098	98.21
10 AVG.	6.47	24.6	3131	92.38	6.17	38.2	3111	92.97	5.32	42.3	3107	99.40
15 AVG.	5.93	29.1	3126	92.05	5.25	41.6	3108	92.29	4.35	48.9	3100	99.10
20 AVG.	5.52	19.6	3142	102.25	4.61	40.7	3112	96.80	3.29	49.1	3103	98.41

APPENDIX D-5 (Cont'd.)

TABLE 23-4. TRUCK 023 SUMMARY - OPERATING DATA
1972 IHC TTDIE 9.31 Litre V-8 GVW 34700 KG Project 11-4133

	EMPTY LOAD - 11113 KG			HALF LOAD - 22226 KG			FULL LOAD - 33340 KG		
Test Desc.	Test No.	RPM	Rack, %	Test No.	RPM	Rack, %	Test No.	RPM	Rack, %
00 SS	71	540	0.0	41	540	0.0	11	540	0.0
05 SS	72	1360	0.0	42	1400	0.0	12	1400	0.0
10 SS	73	1520	0.0	43	1520	0.0	13	1520	0.0
15 SS	74	1680	2.8	44	1700	3.3	14	1720	4.4
20 SS	75	1600	4.4	45	1640	6.7	15	1640	7.2
30 SS	76	1840	11.1	46	1840	14.4	16	2000	16.7
40 SS	77	1840	20.0	47	1880	29.4	17	1860	32.2
55 SS	78	1880	40.5	48	1880	64.4	18	1920	83.3
		Period			Period			Period	
20±5	81	31.0		51	31.0		21	31.0	
30±5	82	48.0		52	48.0		22	48.0	
40±2	86	96.0		56	96.0		26	96.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX D-6

TABLE 24-1. TRUCK 024 SUMMARY - GRAMS/KILOMETRE

1975 Ford TTDIE 9.31 Litre V-8 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	13.83	35.9	4699	32.53	178.5	12.74	31.6	4693	33.34	177.9	13.13	21.3	4759	33.15	179.8
10 SS	7.88	23.1	2949	20.06	111.9	7.17	17.2	2944	20.84	111.3	7.47	14.9	2983	20.36	112.7
15 SS	5.92	17.0	2420	16.18	91.7	5.80	13.0	2478	17.87	93.6	5.93	4.4	2558	17.65	96.1
20 SS	3.61	12.3	1505	11.61	57.1	3.44	6.1	1541	12.39	58.1	3.66	5.5	1580	12.94	59.5
30 SS	2.50	6.0	1364	11.03	51.4	2.61	4.4	1400	12.65	52.6	2.68	3.0	1622	15.19	60.8
40 SS	1.99	4.8	1272	11.74	47.8	2.05	2.2	1388	14.93	52.0	2.24	2.6	1752	21.88	65.6
55 SS	1.61	3.5	1331	17.03	49.9	1.73	1.9	1508	23.40	56.4	2.46	30.5	2266	45.66	86.4
20±5	3.04	4.8	1625	18.11	61.1	3.57	4.6	1907	26.77	71.6	3.19	32.7	2413	41.07	92.0
30±5	2.86	3.9	1398	15.42	52.6	3.17	5.9	1588	22.82	59.8	2.70	30.1	1964	33.61	75.1
40±2	2.01	2.0	1247	14.38	46.7	2.65	2.8	1367	16.86	51.3	2.44	5.0	1706	26.15	64.0
05 AVG.	7.55	20.3	2769	31.11	105.1	7.38	34.1	3049	44.07	116.3	7.66	33.5	3578	57.18	135.9
10 AVG.	4.81	15.8	2186	25.31	82.8	4.88	24.9	2500	37.39	95.0	5.19	44.7	2951	46.58	113.0
15 AVG.	3.73	14.0	1903	21.52	72.0	4.19	22.9	2280	33.15	86.6	3.90	43.4	2827	45.20	108.1
20 AVG.	3.27	12.9	1726	21.19	65.3	3.25	23.2	2050	31.72	78.0	3.20	45.0	2632	45.29	100.9

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX D-6 (Cont'd.)

TABLE 24-2. TRUCK 024 SUMMARY - GRAMS/MINUTE

1975 Ford TTDIE 9.31 Litre V-8 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.60	0.7	119	1.77	38.18	0.50	0.9	124	1.98	39.80	0.52	0.7	125	1.96	39.99
05 SS	2.00	5.2	680	4.71	217.82	1.74	4.3	642	4.56	205.03	1.80	2.9	651	4.53	207.24
10 SS	2.22	6.5	830	5.65	265.65	1.96	4.7	805	5.70	256.67	1.98	4.0	792	5.41	252.14
15 SS	2.33	6.7	954	6.38	304.61	2.29	5.1	977	7.04	310.99	2.34	1.7	1009	6.96	319.28
20 SS	1.95	6.6	811	6.26	259.44	1.86	3.3	830	6.68	263.75	1.92	2.9	826	6.77	262.34
30 SS	2.01	4.8	1098	8.87	348.41	2.12	3.6	1138	10.28	360.52	2.16	2.4	1305	12.22	412.38
40 SS	2.13	5.2	1361	12.57	431.21	2.18	2.4	1474	15.86	465.30	2.38	2.8	1860	23.24	586.80
55 SS	2.36	5.2	1960	25.07	619.33	2.52	2.7	2196	34.07	692.29	3.58	44.4	3300	66.49	1059.90
20±5	1.60	2.5	857	9.55	271.37	1.91	2.4	1023	14.35	323.65	1.70	17.4	1285	21.87	412.99
30±5	2.28	3.1	1116	12.31	353.68	2.54	4.7	1273	18.29	403.83	2.11	23.6	1538	26.32	495.84
40±2	2.15	2.2	1334	15.38	421.28	2.82	3.0	1458	17.98	461.16	2.61	5.3	1825	27.97	577.39
05 AVG.	1.05	2.8	387	4.35	123.70	0.98	4.5	405	5.85	130.09	1.07	4.7	499	7.98	159.91
10 AVG.	1.32	4.3	601	6.96	191.92	1.32	6.7	677	10.13	216.86	1.43	12.3	811	12.80	261.74
15 AVG.	1.48	5.6	756	8.55	241.30	1.65	9.0	899	13.07	287.92	1.52	16.9	1099	17.57	354.37
20 AVG.	1.71	6.7	908	11.14	289.51	1.72	12.2	1080	16.72	346.33	1.66	23.3	1366	23.50	441.18
13-FTP						1.54	11.05	1175	20.23	370.76					
13-FTP						1.46	11.12	1175	20.09	369.55					

*Fuel Consumption in Grams/Minute

13-FTP - 13-Mode Federal Test Procedure

APPENDIX D-6 (Cont'd.)

TABLE 24-3. TRUCK 024 SUMMARY - GRAMS/KILOGRAM OF FUEL
1975 Ford TTDIE 9.31 Litre V-8 GVW 34700 KG Project 11-4133

Test Desc.	EMPTY LOAD - 11113 KG				HALF LOAD - 22226 KG				FULL LOAD - 33340 KG			
	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	15.75	19.6	3110	46.33	12.62	22.4	3115	49.77	13.10	16.8	3123	48.92
05 SS	9.20	23.9	3124	21.63	8.50	21.1	3130	22.24	8.67	14.1	3141	21.88
10 SS	8.35	24.4	3126	21.26	7.64	18.3	3137	22.21	7.86	15.7	3141	21.44
15 SS	7.66	22.1	3131	20.94	7.35	16.5	3141	22.65	7.32	5.4	3159	21.79
20 SS	7.50	25.5	3127	24.12	7.03	12.4	3149	25.33	7.30	10.9	3150	25.79
30 SS	5.76	13.8	3150	25.47	5.89	9.9	3156	28.50	5.24	5.8	3165	29.63
40 SS	4.94	11.9	3156	29.14	4.68	5.1	3167	34.08	4.06	4.8	3170	39.60
55 SS	3.82	8.4	3165	40.48	3.64	3.9	3173	49.22	3.38	41.9	3114	62.73
20±5	5.90	9.4	3157	35.20	5.91	7.5	3160	44.35	4.11	42.1	3111	52.95
30±5	6.45	8.8	3156	34.79	6.29	11.6	3152	45.30	4.26	47.6	3102	53.08
40±2	5.10	5.1	3166	36.50	6.12	6.6	3161	38.98	4.51	9.2	3161	48.45
05 AVG.	8.52	22.9	3127	35.13	7.53	34.8	3112	44.97	6.69	29.2	3123	49.91
10 AVG.	6.89	22.6	3133	36.28	6.09	31.0	3122	46.69	5.45	46.9	3099	48.91
15 AVG.	6.15	23.1	3135	35.45	5.74	31.3	3123	45.39	4.28	47.6	3102	49.59
20 AVG.	5.94	23.4	3135	38.48	4.95	35.2	3119	48.28	3.76	52.9	3095	53.26

APPENDIX D-6 (Cont'd.)

TABLE 24-4. TRUCK 024 SUMMARY - OPERATING DATA
1975 Ford TTDIE 9.31 Litre V-8 GVW 34700 KG Project 11-4133

Test Desc.	EMPTY LOAD - 11113 KG Test No.	RPM	Rack, %	HALF LOAD - 22226 KG Test No.	RPM	Rack, %	FULL LOAD - 33340 KG Test No.	RPM	Rack, %
00 SS	71	575	0.0	41	575	0.0	11	565	0.0
05 SS	72	1775	0.0	42	1700	0.0	12	1750	0.0
10 SS	73	1930	0.0	43	1850	0.0	13	1855	0.2
15 SS	74	2065	0.0	44	2025	1.1	14	2050	1.1
20 SS	75	1750	0.0	45	1750	1.1	15	1715	1.1
30 SS	76	1905	7.8	46	1920	7.8	16	1920	13.9
40 SS	77	1910	17.8	47	1910	20.0	17	1925	32.2
55 SS	78	1935	34.4	48	1935	36.6	18	1950	66.0
		Period			Period			Period	
20±5	81	29.0		51	29.0		21	29.0	
30±5	82	44.0		52	44.0		22	44.0	
40±2	86	70.0		56	70.0		26	70.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX D-6 (Cont'd.)

TABLE 24-5. TRUCK 024 REPEAT SUMMARY - GRAMS/KILOMETRE

1975 Ford TTDIE 9.31 Litre V-8 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	14.20	15.5	4753	33.32	179.3	14.30	26.8	4932	33.00	186.6	14.31	27.7	5088	35.69	192.5
10 SS	8.58	10.3	2951	21.27	111.4	8.26	14.6	3003	20.77	113.5	7.88	17.0	2904	20.01	109.9
15 SS	6.87	10.9	2485	17.95	93.9	6.65	11.9	2467	17.48	93.2	6.86	10.8	2601	18.17	98.2
20 SS	4.05	5.6	1548	12.54	58.4	3.93	6.9	1581	12.55	59.7	4.06	7.1	1691	14.09	63.8
30 SS	2.95	4.0	1371	11.55	51.6	2.91	4.5	1428	12.53	53.7	3.01	5.5	1592	15.78	59.9
40 SS	2.40	2.6	1276	12.90	47.9	2.30	3.0	1397	14.85	52.4	2.69	4.0	1846	24.18	69.2
55 SS	1.94	1.6	1304	17.59	48.8	1.96	2.7	1534	25.36	57.5	2.74	28.1	2223	49.22	84.7
20±5	3.14	6.7	1507	15.27	56.8	3.31	6.1	2081	25.73	78.1	3.35	32.7	2432	41.32	92.7
30±5	2.64	5.1	1333	13.62	50.2	2.48	4.8	1433	20.86	53.9	2.73	26.4	1981	35.58	75.5
40±2	2.05	3.9	1194	12.63	44.9	2.17	3.6	1301	15.72	48.8	2.42	5.0	1715	26.39	64.4
05 AVG.	7.22	22.2	2781	34.35	105.6	7.50	28.7	3136	45.38	119.2	8.40	51.5	3684	57.18	141.0
10 AVG.	5.04	13.3	2155	26.76	81.5	5.01	27.1	2634	39.98	100.1	5.15	49.5	3124	50.77	119.7
15 AVG.	4.00	14.1	1880	22.48	71.2	3.78	24.3	2255	32.36	85.7	3.89	37.0	2813	44.81	107.2
20 AVG.	3.14	14.7	1744	23.40	66.1	3.09	23.1	2099	33.20	79.8	3.38	43.3	2714	47.90	103.9

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX D-6 (Cont'd.)

TABLE 24-6. TRUCK 024 REPEAT SUMMARY - GRAMS/MINUTE
1975 Ford TTDIE 9.31 Litre V-8 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.53	0.4	125	1.97	40.06	0.56	0.7	121	1.84	38.88	0.53	0.8	122	1.88	39.06
05 SS	2.06	2.2	688	4.83	218.86	1.96	3.7	674	4.51	215.15	1.96	3.8	696	4.88	221.92
10 SS	2.28	2.7	783	5.65	249.18	2.19	3.9	797	5.52	253.95	2.15	4.6	794	5.47	253.44
15 SS	2.76	4.4	1000	7.22	318.20	2.67	4.8	992	7.03	316.04	2.76	4.4	1046	7.31	332.85
20 SS	2.15	2.9	822	6.66	261.23	2.08	3.7	840	6.66	267.08	2.09	3.6	871	7.25	276.84
30 SS	2.40	3.2	1114	9.38	353.19	2.32	3.6	1137	9.98	360.43	2.45	4.5	1294	12.82	410.18
40 SS	2.55	2.8	1355	13.69	428.79	2.44	3.1	1484	15.76	469.13	2.71	4.0	1857	24.32	586.61
55 SS	2.86	2.4	1930	26.04	608.89	2.87	3.9	2247	37.13	709.00	4.02	41.1	3256	72.07	1044.72
20±5	1.70	3.6	815	8.25	258.87	1.67	3.1	1049	12.98	332.03	1.82	17.8	1320	22.44	424.42
30±5	2.14	4.2	1081	11.05	342.97	1.92	3.7	1109	16.15	351.45	2.19	21.3	1593	28.61	512.01
40±2	2.24	4.2	1305	13.81	413.46	2.28	3.8	1367	16.52	432.75	2.62	5.4	1858	28.59	587.64
05 AVG.	0.98	3.0	377	4.66	120.67	1.08	4.1	451	6.52	144.42	1.19	7.3	524	8.13	169.06
10 AVG.	1.44	3.8	616	7.65	196.31	1.41	7.6	740	11.23	236.98	1.58	14.0	907	14.69	292.90
15 AVG.	1.62	5.7	760	9.09	242.59	1.58	10.1	940	13.49	301.29	1.59	15.2	1153	18.36	370.34
20 AVG.	1.69	7.9	941	12.63	300.67	1.65	12.3	1118	17.69	358.11	1.78	22.9	1433	25.29	462.17

*Fuel Consumption in Grams/Minute

APPENDIX D-6 (Cont'd.)

TABLE 24-7. TRUCK 024 REPEAT SUMMARY - GRAMS/KILOGRAM OF FUEL
1975 Ford TTDIE 9.31 Litre V-8 GVW 34700 KG Project 11-4133

Test Desc.	EMPTY LOAD - 11113 KG				HALF LOAD - 22226 KG				FULL LOAD - 33340 KG			
	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	13.14	11.2	3131	49.06	14.44	16.8	3118	47.26	13.53	19.6	3117	48.13
05 SS	9.39	10.2	3145	22.05	9.09	17.1	3135	20.97	8.82	17.1	3136	21.99
10 SS	9.14	11.0	3144	22.66	8.64	15.3	3139	21.72	8.50	18.3	3135	21.60
15 SS	8.69	13.8	3141	22.69	8.46	15.1	3140	22.24	8.28	13.1	3144	21.96
20 SS	8.24	11.3	3147	25.49	7.81	13.8	3144	29.94	7.55	13.1	3146	26.20
30 SS	6.79	9.2	3154	26.56	6.42	9.9	3154	27.68	5.97	10.9	3154	31.25
40 SS	5.95	6.5	3161	31.94	5.21	6.7	3163	33.60	4.62	6.8	3165	41.46
55 SS	4.70	4.0	3169	42.77	4.05	5.5	3169	52.37	3.85	39.4	3116	68.99
20±5	6.55	14.0	3148	31.89	5.02	9.2	3160	39.08	4.29	41.8	3111	52.87
30±5	6.23	12.2	3151	32.22	5.46	10.5	3156	45.94	4.28	41.5	3111	55.88
40±2	5.41	10.2	3157	33.40	5.28	8.7	3160	38.18	4.46	9.3	3162	48.65
05 AVG.	8.11	25.0	3125	38.60	7.46	28.6	3122	45.17	7.07	43.3	3100	48.12
10 AVG.	7.34	19.4	3137	38.96	5.94	32.2	3121	47.37	5.11	49.1	3097	50.33
15 AVG.	6.67	23.4	3132	37.46	5.23	33.6	3121	44.79	4.30	40.9	3112	49.58
20 AVG.	5.64	26.3	3131	42.01	4.60	34.3	3122	49.39	3.86	49.5	3100	54.72

APPENDIX D-6 (Cont'd.)

TABLE 24-8. TRUCK 024 ALTERNATE DRIVING CYCLE SUMMARY
1975 Ford TTDIE 9.31 Litre V-8 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel	HC	CO	CO_2	NO_x	Fuel	HC	CO	CO_2	NO_x	Fuel
						Grams/Kilometre									
05 AVG.	5.10	22.4	2413	29.43	91.6*	6.89	32.8	2689	39.49	102.7*	6.47	42.3	2934	46.99	112.3*
10 AVG.	3.75	15.1	1861	24.34	70.5*	4.12	30.7	2138	34.20	81.8*	4.32	36.9	2670	44.38	101.9*
15 AVG.	2.90	12.1	1550	19.82	58.7*	3.03	26.0	1845	29.41	70.5*	3.25	43.4	2458	43.72	94.3*
20 AVG.	2.48	8.1	1335	15.43	50.4*	2.51	16.1	1597	22.99	60.6*	2.61	29.3	1964	33.87	75.0*
						Grams/Minute									
05 AVG.	0.65	2.9	308	3.76	98.62	0.77	3.7	302	4.43	97.18	0.81	5.3	366	5.86	117.98
10 AVG.	1.01	4.1	502	6.57	160.32	1.10	8.2	568	9.08	183.08	1.09	9.3	675	11.22	217.24
15 AVG.	1.19	4.9	633	8.09	201.96	1.24	10.6	755	12.03	243.05	1.25	16.7	947	16.85	306.40
20 AVG.	1.28	4.2	688	7.95	218.87	1.28	8.2	817	11.75	261.26	1.32	14.8	992	17.11	319.68
						Grams/Kilogram of Fuel									
05 AVG.	6.60	29.0	3124	38.11		7.96	37.9	3106	45.61		6.84	44.7	3098	49.63	
10 AVG.	6.30	25.5	3130	40.96		5.98	44.5	3101	49.61		5.02	42.9	3107	51.65	
15 AVG.	5.87	24.4	3133	40.05		5.10	43.8	3105	49.51		4.09	54.6	3091	54.99	
20 AVG.	5.83	19.0	3142	36.32		4.90	31.5	3125	44.99		4.12	46.4	3104	53.54	

*Fuel Consumption in Litre/100 km
XX AVG. - Driving Cycle with designated average speed

APPENDIX D-7

TABLE 25-1. TRUCK 025 SUMMARY - GRAMS/KILOMETRE
1975 IHC TTDIE 14.01 Litre I-6 GVW 34700 KG Project [illegible]-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	9.52	17.7	2355	11.41	89.7	10.22	16.7	2073	10.78	79.3	10.50	17.8	2151	10.83	82.3
10 SS	8.95	19.4	2445	13.00	93.1	8.41	17.8	2449	12.86	93.1	8.32	18.9	2465	12.59	93.7
15 SS	4.46	9.7	1219	6.78	46.4	4.24	9.8	1306	7.10	49.6	4.35	9.6	1297	6.92	49.3
20 SS	3.98	9.0	1200	6.73	45.6	3.70	9.7	1263	7.27	48.0	3.59	9.6	1259	7.01	47.8
30 SS	2.23	6.7	950	6.21	36.0	1.98	7.4	1031	7.42	39.0	1.85	7.6	1133	8.54	42.8
40 SS	1.75	7.5	1038	8.14	39.2	1.58	8.0	1214	10.94	45.8	1.48	7.4	1392	13.61	52.4
55 SS	0.88	4.6	928	10.67	34.9	0.82	5.5	1282	22.51	48.1	0.75	9.4	1613	34.86	60.6
20±5	4.77	11.3	1329	9.44	50.6	6.34	12.4	1528	13.87	58.3	7.08	14.1	1894	21.73	72.1
30±5	2.53	7.6	950	7.65	36.1	3.42	8.4	1194	13.71	45.3	4.39	12.1	1373	20.88	52.3
40±2	1.67	8.1	1030	8.48	39.0	1.51	7.2	1253	12.03	47.2	1.46	6.8	1411	16.62	53.0
05 AVG.	9.91	23.9	2005	15.80	77.1	9.13	24.5	2286	19.30	87.5	9.13	25.7	3310	35.68	125.7
10 AVG.	6.17	20.6	1586	13.22	60.9	6.31	20.5	2047	19.79	78.1	7.36	26.8	2512	29.17	95.9
15 AVG.	5.50	14.4	1315	11.65	50.4	4.95	20.7	1854	18.44	70.8	5.10	25.0	2503	30.22	95.2
20 AVG.	3.61	12.4	1248	12.49	47.5	3.26	15.0	1709	21.21	64.8	3.19	16.9	2113	30.68	80.0

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving cycle with designated average speed

APPENDIX D-7 (Cont'd.)

TABLE 25-2. TRUCK 025 SUMMARY - GRAMS/MINUTE

1975 IHC TTDIE 14.01 Litre I-6 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.55	1.1	90	0.49	29.22	0.55	1.0	89	0.49	29.07	0.54	1.0	90	0.48	29.15
05 SS	1.30	2.4	322	1.56	103.45	1.40	2.3	283	1.47	91.36	1.44	2.4	294	1.48	94.82
10 SS	2.38	5.2	649	3.45	208.35	2.23	4.7	650	3.41	208.35	2.27	5.2	674	3.44	216.12
15 SS	1.76	3.8	481	2.67	154.28	1.71	4.0	525	2.86	168.30	1.71	3.8	511	2.73	163.85
20 SS	2.11	4.8	637	3.57	204.09	1.99	5.2	681	3.92	217.90	1.88	5.0	658	3.66	210.63
30 SS	1.76	5.3	749	4.90	239.03	1.58	5.9	821	5.91	261.80	1.46	6.0	893	6.74	284.47
40 SS	1.87	8.0	1110	8.71	353.83	1.69	8.6	1299	11.71	413.16	1.57	7.8	1478	14.45	468.79
55 SS	1.27	6.6	1337	15.37	423.62	1.19	8.0	1866	32.77	590.08	1.09	13.8	2362	51.04	748.41
20±5	2.43	5.7	677	4.81	217.58	3.27	6.4	788	7.15	253.22	3.55	7.1	950	10.90	304.71
30±5	1.94	5.9	728	5.87	233.11	2.71	6.7	946	10.86	302.52	3.37	9.3	1053	16.01	338.04
40±2	1.73	8.4	1071	8.82	341.64	1.61	7.6	1336	12.83	424.05	1.54	7.1	1483	17.47	469.92
05 AVG.	1.39	3.4	281	2.21	91.03	1.36	3.7	341	2.88	110.01	1.34	3.8	486	5.24	155.58
10 AVG.	1.71	5.7	440	3.67	142.54	1.79	5.8	582	5.63	187.01	2.03	7.4	692	8.03	222.50
15 AVG.	2.19	5.7	524	4.64	169.35	1.99	8.3	747	7.42	240.09	1.94	9.5	953	11.51	305.48
20 AVG.	1.90	6.5	658	6.59	211.36	1.70	7.8	891	11.05	284.71	1.65	8.7	1091	15.84	347.96
13-FTP						1.27	8.02	1152	17.08	362.60					
13-FTP						1.29	7.33	1149	17.23	362.60					

*Fuel Consumption in Grams/Minute

13-FTP - 13-Mode Federal Test Procedure

APPENDIX D-7 (Cont'd.)

TABLE 25-3. TRUCK 025 SUMMARY - GRAMS/KILOGRAM OF FUEL
1975 IHC TTDIE 14.01 Litre I-6 GVW 34700 KG Project 11-4133

Test Desc.	EMPTY LOAD - 11113 KG				HALF LOAD - 22226 KG				FULL LOAD - 33340 KG			
	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	18.91	37.0	3073	16.66	18.95	33.3	3078	16.77	18.36	33.3	3080	16.62
05 SS	12.58	23.5	3114	15.08	15.29	25.0	3103	16.14	15.14	25.6	3102	15.62
10 SS	11.41	24.7	3115	16.57	10.71	22.7	3121	16.39	10.52	23.9	3120	15.94
15 SS	11.39	24.8	3115	17.32	10.14	23.5	3121	16.98	10.46	23.1	3121	16.64
20 SS	10.35	23.5	3121	17.50	9.14	23.9	3124	17.99	8.90	23.9	3125	17.40
30 SS	7.35	22.1	3132	20.50	6.03	22.4	3136	22.56	5.13	21.1	3141	23.68
40 SS	5.28	22.6	3138	24.63	4.09	20.7	3145	28.34	3.34	16.7	3153	30.82
55 SS	3.00	15.7	3156	36.28	2.01	13.6	3162	55.54	1.46	18.4	3157	68.20
20±5	11.17	26.4	3114	22.12	12.91	25.2	3110	28.23	11.65	23.3	3117	35.77
30±5	8.31	25.2	3125	25.16	8.95	22.1	3127	35.91	9.96	27.4	3116	47.37
40±2	5.08	24.6	3136	25.81	3.80	18.0	3150	30.25	3.27	15.1	3156	37.18
05 AVG.	15.25	36.8	3084	24.32	12.37	33.3	3099	26.16	8.62	24.3	3125	33.68
10 AVG.	12.03	40.2	3089	25.76	9.59	31.1	3111	30.08	9.11	33.1	3110	36.10
15 AVG.	12.94	33.9	3096	27.42	8.29	34.8	3109	30.92	6.36	31.2	3121	37.68
20 AVG.	9.00	30.8	3113	31.18	5.96	27.5	3128	38.82	4.73	25.1	3136	45.52

APPENDIX D-7 (Cont'd.)

TABLE 25-4. TRUCK 025 SUMMARY - OPERATING DATA
1975 IHC TTDIE 14.01 Litre I-6 GVW 34700 KG Project 11-4133

Test Desc.	EMPTY LOAD - 11113 KG Test No.	RPM	Rail, psi	HALF LOAD - 22226 KG Test No.	RPM	Rail, psi	FULL LOAD - 33340 KG Test No.	RPM	Rail, psi
00 SS	71	650	0.4	41	650	0.4	11	650	0.4
05 SS	72	1300	6.0	42	1300	5.0	12	1300	4.0
10 SS	73	1920	12.0	43	1900	13.0	13	1900	13.6
15 SS	74	1600	9.0	44	1630	10.0	14	1580	10.2
20 SS	75	1770	12.4	45	1800	15.0	15	1770	14.4
30 SS	76	1680	17.0	46	1700	22.0	16	1700	25.6
40 SS	77	1960	31.6	47	1970	42.4	17	1980	52.0
55 SS	78	1700	45.0	48	1700	79.0	18	1700	116.4
		Period			Period			Period	
20±5	81	34.0		51	34.0		21	34.0	
30±5	82	51.0		52	51.0		22	51.0	
40±2	86	96.0		56	96.0		26	96.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX D-7 (Cont'd.)

TABLE 25-5. TRUCK 025 REPEAT SUMMARY - GRAMS/KILOMETRE
1975 IHC TTDIE 14.01 Litre I-6 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	9.95	20.2	2131	10.17	81.6	11.65	18.5	2295	11.41	87.8	10.38	16.7	2078	10.22	79.5
10 SS	8.33	20.9	2404	11.93	91.6	8.74	17.9	2452	12.02	93.2	8.77	17.9	2459	11.59	93.5
15 SS	4.41	10.6	1250	6.43	47.6	4.41	8.9	1250	6.46	47.5	4.44	9.3	1303	6.47	49.5
20 SS	3.79	10.9	1260	6.65	47.9	3.88	9.4	1295	6.75	49.2	3.66	9.5	1310	7.18	49.7
30 SS	2.03	7.5	916	5.62	34.7	2.03	7.7	1038	6.65	39.3	1.92	7.8	1124	7.62	42.5
40 SS	1.51	8.8	1082	7.78	40.9	1.52	8.4	1245	10.26	47.0	1.51	8.0	1437	13.66	54.1
55 SS	0.67	5.5	954	10.12	35.9	0.74	5.6	1222	20.46	45.9	0.69	9.7	1607	35.55	60.4
20±5	4.90	13.2	1323	9.78	50.6	6.90	13.0	1414	12.48	54.2	7.39	18.3	1932	21.89	73.8
30±5	2.32	8.8	974	8.09	37.0	3.98	9.7	1030	11.21	39.4	4.55	13.8	1351	19.93	51.6
40±2	1.57	9.4	1076	9.12	40.8	1.64	8.7	1220	11.35	46.1	1.57	9.2	1495	16.76	56.3
05 AVG.	10.49	28.3	2300	20.49	88.5	8.95	30.2	2191	19.19	84.3	10.09	37.9	2722	26.60	104.6
10 AVG.	7.07	19.8	1620	12.46	62.2	6.22	24.3	2131	19.70	81.5	7.18	27.9	2546	26.57	97.2
15 AVG.	5.41	16.9	1449	11.69	55.5	4.58	19.9	1870	15.52	71.3	5.26	24.6	2300	26.07	87.6
20 AVG.	3.67	16.2	1387	12.69	53.0	3.25	16.5	1689	20.47	64.2	3.61	21.6	2023	27.62	77.0

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX D-7 (Cont'd.)

TABLE 25-6. TRUCK 025 REPEAT SUMMARY - GRAMS/MINUTE
1975 IHC TTDIE 14.01 Litre I-6 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.62	1.1	92	0.52	29.93	0.60	1.0	90	0.50	29.18	0.55	0.9	89	0.44	29.00
05 SS	1.68	3.4	360	1.72	116.21	1.59	2.5	314	1.56	101.20	1.42	2.3	284	1.40	91.60
10 SS	2.48	6.2	716	3.55	229.79	2.46	5.0	690	3.38	221.29	2.40	4.9	673	3.17	215.65
15 SS	1.78	4.3	503	2.59	161.50	1.78	3.6	503	2.60	161.15	1.82	3.8	535	2.66	171.25
20 SS	2.07	6.0	689	3.64	221.00	2.09	5.1	698	3.64	223.43	2.00	5.2	716	3.93	229.11
30 SS	1.63	6.0	737	4.53	235.63	1.65	6.3	844	5.41	269.16	1.54	6.3	904	6.13	287.97
40 SS	1.61	9.4	1157	8.33	369.06	1.64	9.1	1342	11.06	426.67	1.62	8.6	1550	14.73	491.59
55 SS	0.98	8.1	1404	14.91	445.04	1.10	8.3	1810	30.29	572.44	1.02	14.3	2366	52.34	749.76
20±5	2.60	7.0	702	5.18	225.91	3.45	6.5	706	6.23	227.97	3.80	9.4	993	11.26	319.73
30±5	1.86	7.1	781	6.48	250.07	3.00	7.3	777	8.45	249.96	3.53	10.7	1048	15.46	337.32
40±2	1.69	10.1	1162	9.85	371.05	1.71	9.1	1273	11.85	405.36	1.63	9.5	1553	17.40	493.01
05 AVG.	1.43	3.8	313	2.79	101.42	1.30	4.4	317	2.78	102.89	1.46	5.5	394	3.85	127.68
10 AVG.	1.94	5.4	445	3.42	143.93	1.72	6.7	588	5.43	189.16	1.94	7.5	687	7.17	220.93
15 AVG.	2.19	6.8	587	4.74	189.36	1.79	7.8	730	6.06	234.30	2.06	9.6	899	10.19	258.70
20 AVG.	1.94	8.6	734	6.72	236.27	1.66	8.4	863	10.46	276.23	1.81	10.8	1012	13.82	324.37

*Fuel Consumption in Grams/Minute

APPENDIX D-7 (Cont'd.)

TABLE 25-7. TRUCK 025 REPEAT SUMMARY - GRAMS/KILOGRAM OF FUEL
1975 IHC TTDIE 14.01 Litre I-6 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG				HALF LOAD - 22226 KG				FULL LOAD - 33340 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	20.67	36.9	3067	17.46	20.71	33.2	3073	17.07	18.98	31.5	3081	15.04
05 SS	14.47	29.4	3099	14.79	15.75	25.0	3101	15.42	15.50	25.0	3102	15.26
10 SS	10.79	27.0	3114	15.45	11.12	22.7	3120	15.29	11.12	22.7	3120	14.70
15 SS	10.99	26.5	3114	16.02	11.02	22.2	3121	16.13	10.64	22.3	3122	15.50
20 SS	9.38	27.0	3118	16.45	9.36	22.8	3125	16.29	8.73	22.8	3127	17.14
30 SS	6.92	25.5	3128	19.21	6.14	23.3	3134	20.09	5.36	21.7	3139	21.27
40 SS	4.37	25.5	3136	22.57	3.85	21.2	3145	25.91	3.30	17.5	3152	29.96
55 SS	2.20	18.1	3155	33.49	1.92	14.5	3161	52.92	1.36	19.1	3156	69.82
20±5	11.51	31.1	3105	22.95	15.11	28.4	3098	27.34	11.88	29.4	3107	35.20
30±5	7.43	28.4	3122	25.92	12.01	29.1	3107	33.80	10.47	31.7	3108	45.84
40±2	4.56	27.3	3133	26.55	4.22	22.5	3141	29.23	3.31	19.3	3149	35.30
05 AVG.	14.07	37.9	3086	27.49	12.60	42.5	3084	27.00	11.45	43.0	3087	30.17
10 AVG.	13.48	37.8	3088	23.76	9.07	35.4	3106	28.71	8.76	34.1	3109	32.46
15 AVG.	11.57	36.0	3097	25.01	7.64	33.2	3114	25.85	7.12	33.3	3115	35.31
20 AVG.	8.22	36.3	3107	28.43	6.00	30.5	3123	37.85	5.57	33.3	3120	42.60

APPENDIX D-7 (Cont'd.)

TABLE 25-8. TRUCK 025 ALTERNATE DRIVING CYCLE SUMMARY
1975 IHC TTDIE 14.01 Litre I-6 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 1113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel	HC	CO	CO_2	NO_x	Fuel	HC	CO	CO_2	NO_x	Fuel
Grams/Kilometre															
05 AVG.	10.17	25.1	2070	13.94	79.6*	9.42	29.1	2300	19.50	88.3*	10.09	37.9	2722	26.60	104.6*
10 AVG.	5.94	15.7	1559	12.43	59.6*	5.81	23.9	1575	15.23	60.6*	6.01	25.9	2238	28.24	85.4*
15 AVG.	4.46	15.4	1087	9.79	41.8*	4.56	20.2	1811	19.02	69.1*	4.89	22.6	2108	25.74	80.3*
20 AVG.	3.47	11.0	1332	11.99	50.6*	3.39	13.1	1646	19.03	62.4*	3.39	16.2	1892	24.63	71.7*
Grams/Minute															
05 AVG.	1.54	3.8	312	2.10	101.30	1.49	4.6	363	3.08	117.60	1.46	5.5	394	3.85	127.68
10 AVG.	1.61	4.3	423	3.37	136.35	1.56	6.4	423	4.09	137.18	1.59	6.8	592	7.46	190.39
15 AVG.	1.86	6.5	454	4.09	147.43	1.87	8.3	743	7.81	238.96	1.92	8.8	826	10.09	265.13
20 AVG.	1.92	6.1	736	6.62	235.51	1.90	7.3	923	10.67	294.84	1.80	8.6	1008	13.12	322.03
Grams/Kilogram of Fuel															
05 AVG.	15.15	37.4	3084	20.77		12.65	39.1	3089	26.19		11.45	43.0	3087	30.17	
10 AVG.	11.83	31.3	3104	24.75		11.36	46.7	3081	29.79		8.34	36.0	3107	39.21	
15 AVG.	12.64	43.8	3082	27.76		7.83	34.7	3111	32.69		7.23	33.3	3115	38.05	
20 AVG.	8.14	25.7	3124	28.12		6.44	24.9	3131	36.19		5.60	26.7	3131	40.75	

*Fuel Consumption in Litre/100 km
XX AVG. - Driving Cycle with designated average speed

APPENDIX D-8

TABLE 26-1. TRUCK 026 SUMMARY - GRAMS/KILOMETRE

1974 Ford TTDIE 6.98 Litre I-6 GVW 22589 KG Project 11-4133

Test Desc.	EMPTY LOAD - 7258 KG					HALF LOAD - 14515 KG					FULL LOAD - 21773 KG				
	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	4.23	17.1	2132	16.65	80.8	5.66	7.8	2112	16.39	79.7	5.38	15.4	2111	15.38	80.0
10 SS	2.46	9.5	1333	10.45	50.4	3.27	4.3	1330	11.19	50.1	3.08	8.8	1348	10.04	51.0
15 SS	2.01	7.6	1110	8.70	42.0	2.68	3.3	1138	8.86	42.8	2.46	6.5	1120	8.07	42.3
20 SS	1.56	5.2	894	7.40	33.7	1.95	2.8	917	7.59	34.5	1.83	4.9	945	7.60	35.7
30 SS	0.94	4.0	720	7.21	27.1	1.19	1.5	774	7.82	29.0	1.13	2.3	833	8.18	31.2
40 SS	0.93	2.8	824	8.80	30.9	1.09	0.9	925	10.62	34.6	1.09	2.2	1008	11.87	37.7
55 SS	0.91	2.1	973	16.49	36.4	1.30	3.3	1181	24.97	44.3	1.24	21.6	1412	30.05	53.9
20±5	1.02	1.4	949	10.01	32.7	1.65	2.5	1131	13.90	39.1	1.97	20.0	1581	22.33	55.5
30±5	0.88	1.2	771	9.04	26.6	1.29	1.9	805	11.00	27.8	1.24	13.6	1011	16.16	35.5
40±2	0.82	0.8	833	9.52	28.7	1.15	1.0	892	10.68	30.7	1.19	3.2	1011	13.10	34.9
05 AVG.	3.03	7.7	1470	19.58	51.1	3.32	13.4	1593	20.16	55.7	3.41	22.3	1837	26.11	64.5
10 AVG.	2.04	9.1	1214	15.75	42.3	2.19	11.6	1329	18.19	46.4	2.38	18.7	1549	22.68	54.3
15 AVG.	1.54	6.7	1029	13.17	35.8	1.72	9.9	1233	16.53	43.0	1.85	20.3	1428	21.18	50.2
20 AVG.	1.50	8.0	1059	14.77	36.9	1.56	14.4	1198	18.36	42.0	1.66	25.4	1420	23.55	50.2

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed

XX ±Y - Sinusoidal with designated average speed and amplitude

XX AVG. - Driving Cycle with designated average speed

APPENDIX D-8 (Cont'd.)

TABLE 26-2. TRUCK 026 SUMMARY - GRAMS/MINUTE
1974 Ford TTDIE 6.98 Litre I-6 GVW 22589 KG Project 11-4133

Test	EMPTY LOAD - 7258 KG					HALF LOAD - 14515 KG					FULL LOAD - 21773 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.15	0.2	65	1.10	20.60	0.17	0.3	66	1.08	21.09	0.17	0.5	66	1.05	21.08
05 SS	0.55	2.2	274	2.14	87.67	0.73	1.0	272	2.11	86.44	0.74	2.1	289	2.10	92.25
10 SS	0.63	2.4	343	2.69	109.36	0.87	1.1	353	2.97	112.10	0.79	2.3	347	2.59	110.67
15 SS	0.79	3.0	438	3.43	139.43	1.04	1.3	439	3.42	139.34	0.95	2.5	432	3.12	137.69
20 SS	0.82	2.7	467	3.87	148.65	1.04	1.5	487	4.03	154.45	0.96	2.5	494	3.98	157.16
30 SS	0.75	3.2	574	5.75	182.10	0.95	1.2	617	6.23	194.82	0.90	1.8	663	6.52	209.64
40 SS	0.98	3.0	869	9.28	274.80	1.15	0.9	982	11.27	309.52	1.15	2.3	1062	12.51	335.16
55 SS	1.33	3.1	1425	24.15	449.54	1.89	4.7	1720	36.36	543.38	1.81	31.4	2056	43.75	661.68
20±5	0.54	0.8	498	5.25	157.04	0.87	1.3	596	7.33	188.47	1.07	10.8	858	12.12	275.29
30±5	0.70	1.0	614	7.21	193.75	1.03	1.5	645	8.82	204.00	1.01	11.2	830	13.26	266.53
40±2	0.87	0.9	889	10.15	279.89	1.24	1.1	963	11.53	303.68	1.32	3.6	1116	14.46	352.84
05 AVG.	0.43	1.1	208	2.77	66.18	0.48	1.9	229	2.90	73.20	0.48	3.1	257	3.66	82.67
10 AVG.	0.57	2.5	338	4.39	107.90	0.63	3.3	382	5.22	121.93	0.66	5.2	431	6.31	138.41
15 AVG.	0.61	2.7	409	5.23	130.09	0.71	4.1	510	6.83	162.52	0.73	8.1	566	8.40	182.15
20 AVG.	0.80	4.3	565	7.88	180.09	0.83	7.7	641	9.82	205.45	0.87	13.3	744	12.34	240.52
13-FTP						0.95	8.8	878	14.34	277.01					
13-FTP						1.12	8.6	880	13.99	277.01					

*Fuel Consumption in Grams/Minute

13-FTP - 13-Mode Federal Test Procedure

APPENDIX D-8 (Cont'd.)

TABLE 26-3. TRUCK 026 SUMMARY - GRAMS/KILOGRAM OF FUEL
1974 Ford TTDIE 6.98 Litre I-6 GVW 22589 KG Project 11-4133

Test	EMPTY LOAD - 7258 KG				HALF LOAD - 14515 KG				FULL LOAD - 21773 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	7.41	10.8	3150	53.19	8.26	16.2	3139	51.13	8.23	21.6	3130	49.88
05 SS	6.22	25.2	3131	24.45	8.43	11.6	3145	24.40	7.97	22.9	3129	22.80
10 SS	5.79	22.3	3137	24.59	7.74	10.3	3150	26.50	7.16	20.5	3135	23.36
15 SS	5.67	21.4	3139	24.61	7.43	9.2	3152	24.56	6.90	18.3	3140	22.63
20 SS	5.48	18.4	3144	26.03	6.71	9.6	3154	26.10	6.09	16.2	3146	25.30
30 SS	4.09	17.6	3150	31.55	4.88	6.2	3165	31.97	4.28	8.8	3163	31.08
40 SS	3.56	10.9	3162	33.76	3.73	3.0	3174	36.42	3.43	7.0	3168	37.34
55 SS	2.96	6.8	3170	53.72	3.48	8.7	3165	66.91	2.74	47.4	3107	66.12
20±5	3.41	4.8	3172	33.45	4.62	7.0	3165	38.87	3.89	39.4	3116	44.01
30±5	3.62	5.0	3171	37.19	5.06	7.5	3162	43.24	3.81	41.9	3112	49.76
40±2	3.12	3.1	3175	36.27	4.09	3.5	3172	37.97	3.73	10.1	3163	40.98
05 AVG.	6.47	16.5	3144	41.89	6.53	26.2	3128	39.59	5.79	37.8	3113	44.24
10 AVG.	5.28	23.5	3137	40.70	5.16	27.3	3131	42.85	4.79	37.7	3116	45.62
15 AVG.	4.71	20.5	3143	40.23	4.38	25.2	3137	42.05	4.03	44.2	3108	46.09
20 AVG.	4.46	23.8	3139	43.78	4.06	37.4	3119	47.81	3.62	55.2	3092	51.29

APPENDIX D-8 (Cont'd.)

TABLE 26-4. TRUCK 026 SUMMARY - OPERATING DATA
1974 Ford TTDIE 6.98 Litre I-6 GVW 22589 KG Project 11-4133

	EMPTY LOAD - 7258 KG			HALF LOAD - 14515 KG			FULL LOAD - 21773 KG		
Test Desc.	Test No.	RPM	Rack, %	Test No.	RPM	Rack, %	Test No.	RPM	Rack, %
00 SS	71	480	0.0	41	480	0.0	11	480	0.0
05 SS	72	1360	0.0	42	1360	0.0	12	1400	0.0
10 SS	73	1500	0.0	43	1520	0.0	13	1500	0.2
15 SS	74	1600	0.0	44	1680	0.0	14	1680	0.2
20 SS	75	1640	0.1	45	1640	0.6	15	1600	0.6
30 SS	76	1600	5.6	46	1600	7.8	16	1600	10.0
40 SS	77	1840	16.7	47	1840	21.6	17	1840	23.9
55 SS	78	1920	38.9	48	1920	48.8	18	1920	62.7
		Period			Period			Period	
20±5	81	24.0		51	24.0		21	24.0	
30±5	82	38.0		52	38.0		22	38.0	
40±2	86	70.0		56	70.0		26	70.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX D-9

TABLE 27-1. TRUCK 027 SUMMARY - GRAMS/KILOMETRE

1972 IHC TTDIF 14.80 Litre V-8 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG					HALF LOAD - 22226 KG					FULL LOAD - 33340 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	8.21	12.2	1979	11.91	75.3	11.20	13.9	2091	12.11	79.9	9.81	13.7	2122	12.76	80.9
10 SS	14.15	14.6	2042	11.18	78.4	12.40	12.5	2109	11.67	80.6	11.48	13.1	1985	11.20	75.9
15 SS	11.80	11.8	1729	10.17	66.4	9.41	8.4	1706	10.27	65.0	9.50	8.5	1754	10.85	66.8
20 SS	7.35	8.0	1385	8.76	52.8	6.31	5.5	1306	8.93	51.6	6.19	5.5	1437	9.81	54.5
30 SS	2.21	3.1	839	6.99	31.6	1.76	2.2	901	7.89	33.8	1.71	2.4	1003	10.24	37.6
40 SS	1.93	2.8	915	8.71	34.4	1.77	2.2	1082	11.93	40.6	2.04	2.6	1279	16.97	48.0
55 SS	1.85	2.9	1061	15.12	39.8	1.61	8.7	1389	23.15	52.4	0.38	39.0	1837	25.97	70.6
20±5	4.84	5.3	895	9.78	34.2	5.39	5.9	1123	15.85	42.7	5.17	26.6	1539	22.83	59.4
30±5	4.68	5.2	1012	9.81	38.5	5.09	8.0	1204	14.79	45.8	3.65	21.1	1552	20.69	59.4
40±2	1.99	3.0	919	9.57	34.6	2.09	3.1	1103	13.96	41.5	1.88	11.0	1406	19.71	53.1
05 AVG.	8.45	16.0	1876	17.49	71.7	8.00	24.1	2167	22.88	82.9	10.58	38.4	2616	28.99	100.8
10 AVG.	5.38	13.4	1367	14.81	52.2	5.18	22.4	1713	20.74	65.6	5.43	35.7	1988	25.82	76.7
15 AVG.	4.09	7.7	1160	12.52	44.1	4.24	21.5	1594	21.54	61.0	3.83	39.9	1945	25.57	75.1
20 AVG.	3.39	10.7	1163	13.82	44.3	3.01	25.9	1560	20.69	59.9	2.56	40.8	1907	23.21	73.6

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX D-9 (Cont'd.)

TABLE 27-2. TRUCK 027 SUMMARY - GRAMS/MINUTE

1972 IHC TTDIE 14.80 Litre V-8 GVW 34700 KG Project 11-4133

Test Desc.	EMPTY LOAD - 11113 KG HC	CO	CO_2	NO_x	Fuel*	HALF LOAD - 22226 KG HC	CO	CO_2	NO_x	Fuel*	FULL LOAD - 33340 KG HC	CO	CO_2	NO_x	Fuel*
00 SS	0.31	0.6	101	0.68	32.41	0.33	0.6	92	0.60	29.61	0.31	0.6	96	0.61	30.58
05 SS	1.06	1.6	255	1.53	81.67	1.53	1.9	286	1.66	92.09	1.42	2.0	307	1.85	98.68
10 SS	3.76	3.9	542	2.97	175.50	3.39	3.4	577	3.19	185.85	3.05	3.5	527	2.97	169.86
15 SS	4.65	4.7	682	4.01	220.56	3.79	3.4	686	4.13	220.51	3.82	3.4	706	4.37	226.64
20 SS	3.90	4.2	735	4.65	236.44	3.35	2.9	722	4.74	231.03	3.34	3.0	774	5.29	247.53
30 SS	1.75	2.4	661	5.51	210.14	1.40	1.7	718	6.28	227.16	1.35	1.9	791	8.08	250.08
40 SS	2.05	3.0	972	9.25	308.02	1.88	2.3	1149	12.67	363.31	2.18	2.8	1369	18.15	432.64
55 SS	2.68	4.2	1536	21.89	486.31	2.35	12.8	2034	33.89	646.32	0.52	53.9	2541	35.93	823.71
20±5	2.68	3.0	495	5.41	159.24	2.93	3.2	610	8.62	195.78	2.80	14.4	834	12.37	271.35
30±5	3.92	4.4	847	8.21	271.48	4.20	6.6	993	12.19	318.52	3.02	17.4	1285	17.12	414.28
40±2	2.22	3.4	1023	10.66	324.64	2.30	3.4	1214	15.35	384.34	2.09	12.3	1567	21.97	499.26
05 AVG.	1.25	2.4	277	2.58	89.26	1.20	3.6	324	3.43	104.65	1.60	5.8	397	4.40	128.82
10 AVG.	1.58	3.9	401	4.34	129.20	1.43	6.2	472	5.71	152.32	1.57	10.3	574	7.46	186.57
15 AVG.	1.64	3.1	466	5.04	149.35	1.78	9.0	668	9.03	215.64	1.61	16.7	817	10.74	265.96
20 AVG.	1.83	5.8	629	7.48	201.89	1.68	14.5	872	11.57	282.26	1.41	22.5	1052	12.80	342.20
13-FTP						1.38	12.76	1175	17.19	400.10					
13-FTP						1.38	12.75	1176	16.98	400.10					

*Fuel Consumption in Grams/Minute

13-FTP - 13-Mode Federal Test Procedure

APPENDIX D-9 (Cont'd.)

TABLE 27-3. TRUCK 027 SUMMARY - GRAMS/KILOGRAM OF FUEL
1972 IHC TTDIE 14.80 Litre V-8 GVW 34700 KG Project 11-4133

Test	EMPTY LOAD - 11113 KG				HALF LOAD - 22226 KG				FULL LOAD - 33340 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	9.63	19.9	3129	20.89	11.27	20.6	3122	20.14	10.27	19.9	3127	19.80
05 SS	12.94	19.3	3119	18.77	16.64	20.7	3106	17.98	14.40	20.2	3113	18.73
10 SS	21.40	22.1	3088	16.91	18.25	18.5	3104	17.17	17.94	20.4	3102	17.50
15 SS	21.08	21.1	3091	18.17	17.17	15.4	3112	18.74	16.85	15.1	3114	19.27
20 SS	16.50	17.9	3110	19.63	14.51	12.7	3125	20.53	13.48	12.1	3129	21.36
30 SS	8.31	11.5	3146	26.24	6.18	7.5	3159	27.67	5.40	7.5	3161	32.29
40 SS	6.66	9.7	3154	30.02	5.18	6.5	3164	34.88	5.03	6.4	3164	41.96
55 SS	5.52	8.7	3159	45.02	3.64	19.7	3148	52.44	0.63	65.4	3085	43.62
20±5	16.80	18.5	3108	33.95	14.98	16.3	3118	44.01	10.32	53.1	3074	45.60
30±5	14.42	16.0	3120	30.24	13.17	20.7	3116	38.27	7.30	42.1	3101	41.34
40±2	6.83	10.4	3152	32.85	5.99	8.8	3157	39.95	4.19	34.6	3138	44.00
05 AVG.	13.98	26.6	3105	28.95	11.44	34.4	3100	32.73	12.45	45.3	3080	34.13
10 AVG.	12.21	30.3	3104	33.63	9.36	40.5	3097	37.49	8.39	55.2	3077	39.96
15 AVG.	11.01	20.7	3123	33.72	8.24	41.8	3099	41.88	6.05	63.0	3072	40.39
20 AVG.	9.09	28.7	3117	37.03	5.96	51.4	3091	40.99	4.12	65.8	3074	37.40

APPENDIX D-9 (Cont'd.)

TABLE 27-4. TRUCK 027 SUMMARY - OPERATING DATA
1972 IHC TTDIE 14.80 Litre V-8 GVW 34700 KG Project 11-4133

	EMPTY LOAD - 11113 KG			HALF LOAD - 22226 KG			FULL LOAD - 33340 KG		
Test Desc.	Test No.	RPM	Rail, psi	Test No.	RPM	Rail, psi	Test No.	RPM	Rail, psi
00 SS	71	640	2.0	41	640	2.0	11	640	2.0
05 SS	72	1500	6.0	42	1500	6.0	12	1500	6.0
10 SS	73	2200	14.0	43	2200	14.0	13	2100	13.0
15 SS	74	2400	18.0	44	2400	18.0	14	2400	20.0
20 SS	75	2400	19.0	45	2400	20.0	15	2400	20.0
30 SS	76	1920	17.0	46	1920	20.0	16	1920	24.0
40 SS	77	2200	30.0	47	2200	40.0	17	2240	52.0
55 SS	78	2280	64.0	48	2300	107.0	18	2200	158.0
		Period			Period			Period	
20±5	81	32.0		51	32.0		21	32.0	
30±5	82	42.0		52	42.0		22	42.0	
40±2	86	60.0		56	60.0		26	60.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX D-10

TABLE 28-1. TRUCK 028 SUMMARY - GRAMS/KILOMETRE

1967 Dodge D3DIF 12.18 Litre I-6 GVW 18824 KG Project 11-4133

Test Desc.	EMPTY LOAD - 7258 KG					HALF LOAD - 11113 KG					FULL LOAD - 18371 KG				
	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	7.41	25.4	2355	17.80	89.9	8.70	26.7	2476	19.17	94.6	8.09	24.3	2194	16.50	83.9
10 SS	6.13	18.6	1909	13.64	72.8	6.70	20.4	1945	13.12	74.3	6.60	22.9	1946	13.17	74.5
15 SS	3.56	11.1	1144	8.17	43.6	4.28	11.9	1184	8.63	45.2	4.30	14.5	1184	9.33	45.4
20 SS	3.28	9.5	1000	6.93	38.1	3.43	9.9	988	7.45	37.7	3.56	11.7	1061	8.31	40.5
30 SS	1.8[illegible]	5.4	680	5.47	25.8	1.92	6.2	712	6.15	27.1	1.65	6.8	796	7.49	30.2
40 SS	1.84	5.5	663	5.38	25.2	1.24	6.1	725	6.77	27.5	1.33	9.8	889	9.82	33.8
55 SS	1.07	6.7	686	6.35	26.0	1.51	16.5	874	9.81	33.6	0.61	51.6	1197	14.78	47.6
20±5	3.34	11.2	1060	8.91	40.6	3.50	12.6	1065	8.37	40.9	3.89	16.8	1143	9.61	44.1
30±5	2.11	6.7	698	6.67	26.7	2.48	9.0	741	6.80	28.5	2.69	19.4	877	9.45	34.2
40±2	1.57	4.6	648	6.02	24.7	1.45	6.1	702	6.44	26.8	1.68	10.8	877	9.14	33.6
05 AVG.	8.65	27.3	2031	17.32	78.5	7.59	24.3	1801	14.88	69.6	8.13	38.0	2209	19.39	85.7
10 AVG.	5.55	26.0	1356	11.39	52.8	4.98	28.2	1510	13.63	58.6	5.54	42.9	1817	16.96	71.0
15 AVG.	4.03	23.0	1066	9.88	41.6	3.87	29.0	1192	11.53	46.7	3.34	48.6	1625	16.82	63.9
20 AVG.	3.06	14.1	960	8.09	37.0	2.98	16.9	1027	9.25	39.7	3.17	36.0	1403	13.23	54.9

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX D-10 (Cont'd.)

TABLE 28-2. TRUCK 028 SUMMARY - GRAMS/MINUTE
1967 Dodge D3DIE 12. 8 Litre I-6 GVW 18824 KG Project 11-4133

Test Desc.	EMPTY LOAD - 7258 KG					HALF LOAD - 11113 KG					FULL LOAD - 18371 KG				
	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.38	0.9	95	1.13	30.58	0.39	1.0	92	1.11	29.57	0.38	1.0	87	0.93	28.25
05 SS	1.01	3.5	322	2.43	103.68	1.19	3.7	339	2.62	109.10	1.04	3.1	282	2.12	91.08
10 SS	1.58	4.8	492	3.51	157.98	1.83	5.6	532	3.59	171.31	1.75	6.1	517	3.50	166.67
15 SS	1.40	4.4	451	3.22	144.86	1.72	4.8	476	3.47	153.33	1.73	5.8	476	3.75	153.87
20 SS	1.74	5.1	531	3.68	170.70	1.85	5.3	533	4.02	171.39	1.89	6.2	563	4.41	181.46
30 SS	1.48	4.3	547	4.40	174.96	1.55	4.9	573	4.95	183.46	1.34	5.6	647	6.09	206.74
40 SS	1.97	5.9	710	5.76	227.26	1.32	6.5	776	7.25	247.76	1.42	10.4	951	10.51	304.73
55 SS	1.58	9.9	1015	9.40	324.66	2.23	24.4	1293	14.52	419.52	0.84	71.5	1656	20.46	555.11
20±5	1.82	6.1	576	4.84	185.47	1.83	6.6	556	4.37	179.30	2.07	9.0	608	5.11	196.88
30±5	1.72	5.5	568	5.43	182.46	1.99	7.2	595	5.47	192.13	2.16	15.6	704	7.58	230.38
40±2	1.71	5.0	707	6.57	225.77	1.57	6.6	762	6.98	243.74	1.81	11.6	945	9.85	303.85
05 AVG.	1.27	4.0	299	2.55	96.86	1.08	3.5	257	2.12	83.19	1.18	5.5	320	2.81	104.07
10 AVG.	1.50	7.0	367	3.08	119.93	1.31	7.4	396	3.57	128.99	1.52	11.8	499	4.66	163.88
15 AVG.	1.69	9.6	447	4.15	146.66	1.55	11.6	479	4.63	157.47	1.36	19.8	664	6.87	219.10
20 AVG.	1.71	7.9	536	4.51	173.49	1.61	9.1	554	4.99	179.79	1.78	20.2	788	7.43	258.70
13-FTP						1.11	15.3	696	8.31	233.17					
13-FTP						1.06	15.1	714	8.27	233.17					

*Fuel Consumption in Grams/Minute

13-FTP - 13-Mode Federal Test Procedure

APPENDIX D-10 (Cont'd.)

TABLE 28-3. TRUCK 028 SUMMARY - GRAMS/KILOGRAM OF FUEL
1967 Dodge D3DIE 12.18 Litre I-6 GVW 18824 KG Project 11-4133

Test	EMPTY LOAD - 7258 KG				HALF LOAD - 11113 KG				FULL LOAD - 18371 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	12.38	28.0	3107	37.00	13.29	32.5	3097	37.70	13.52	34.6	3093	32.74
05 SS	9.77	33.6	3107	23.48	10.91	33.5	3103	24.03	11.44	34.4	3100	23.32
10 SS	9.99	30.2	3111	22.23	10.70	32.5	3105	20.96	10.51	36.6	3100	20.98
15 SS	9.68	30.2	3112	22.24	11.22	31.2	3106	22.63	11.24	37.8	3095	24.39
20 SS	10.20	29.7	3112	21.54	10.80	31.1	3107	23.44	10.41	34.4	3103	24.33
30 SS	8.46	24.7	3125	25.16	8.42	27.0	3121	26.98	6.48	26.9	3127	29.44
40 SS	8.68	25.8	3122	25.34	5.35	26.4	3132	29.26	4.67	34.2	3122	34.49
55 SS	4.88	30.6	3127	28.94	5.32	58.1	3082	34.61	1.52	128.7	2983	36.85
20±5	9.80	32.7	3108	26.12	10.19	36.7	3101	24.36	10.50	45.5	3086	25.94
30±5	9.42	30.0	3113	29.75	10.38	37.7	3098	28.46	9.38	67.6	3054	32.92
40±2	7.59	22.3	3131	29.09	6.44	27.0	3127	28.65	5.96	38.2	3111	32.42
05 AVG.	13.13	41.5	3084	26.29	12.99	41.7	3084	25.48	11.30	52.9	3072	26.96
10 AVG.	12.51	58.6	3059	25.69	10.13	57.4	3068	27.71	9.29	72.0	3048	28.45
15 AVG.	11.54	65.8	3051	28.28	9.87	74.0	3043	29.43	6.22	90.5	3028	31.34
20 AVG.	9.86	45.4	3088	26.02	8.95	50.9	3082	27.78	6.87	78.1	3046	28.73

APPENDIX D-10 (Cont'd.)

TABLE 28-4. TRUCK 028 SUMMARY - OPERATING DATA
1967 Dodge D3DIE 12.18 Litre I-6 GVW 18824 KG Project 11-4133

	EMPTY LOAD - 7258 KG			HALF LOAD - 11113 KG			FULL LOAD - 18371 KG		
Test Desc.	Test No.	RPM	Rail, psi	Test No.	RPM	Rail, psi	Test No.	RPM	Rail, psi
00 SS	71	680	4.0	41	680	4.0	11	680	4.0
05 SS	72	1640	13.0	42	1680	13.0	12	1600	11.0
10 SS	73	2000	20.0	43	2100	23.0	13	2040	20.0
15 SS	74	1880	19.0	44	1920	20.0	14	1920	20.0
20 SS	75	1960	21.0	45	2000	23.0	15	1960	24.0
30 SS	76	1800	23.0	46	1760	25.0	16	1800	30.0
40 SS	77	1840	32.0	47	1840	38.0	17	1840	50.0
55 SS	78	2000	56.0	48	2000	80.0	18	1900	120.0
		Period			Period			Period	
20±5	81	42.0		51	42.0		21	42.0	
30±5	82	54.0		52	54.0		22	54.0	
40±2	86	120.0		56	120.0		26	120.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX D-11

TABLE 29-1. TRUCK 029 SUMMARY - GRAMS/KILOMETRE
1975 IHC D2DIE 9.39 Litre V-8 GVW 11413 KG Project 11-4133

Test	EMPTY LOAD - 7258 KG					HALF LOAD - 9299 KG					FULL LOAD - 11113 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	15.23	30.1	1580	11.13	62.3	14.73	26.1	1635	12.28	64.1	16.32	29.2	1767	12.67	69.3
10 SS	9.00	17.7	1025	7.70	40.2	8.77	16.5	1039	8.25	40.6	9.28	17.0	1074	8.44	42.0
15 SS	7.38	13.7	886	6.56	34.6	7.18	13.5	894	7.16	34.9	7.48	12.8	917	7.13	35.7
20 SS	5.42	10.8	742	6.07	28.9	5.29	10.0	735	6.44	28.5	5.59	10.2	770	6.53	29.9
30 SS	3.27	6.5	619	5.80	23.8	3.09	5.8	640	6.40	24.5	3.27	5.3	679	6.54	25.9
40 SS	2.49	4.8	685	6.68	26.0	2.34	3.7	721	7.51	27.3	2.25	3.5	751	7.60	28.4
55 SS	1.65	2.6	769	8.24	28.9	1.44	1.9	853	9.24	32.0	0.99	1.4	941	9.58	35.2
20±5	4.27	5.9	825	8.17	31.5	2.85	5.8	898	8.86	34.1	2.31	4.3	960	9.54	36.2
30±5	3.04	4.4	657	6.97	25.0	2.53	4.7	709	7.32	26.9	2.53	3.9	726	7.66	27.5
40±2	2.64	4.0	699	7.61	26.6	2.28	4.4	748	7.72	28.3	2.56	4.2	771	8.36	29.2
05 AVG.	6.80	11.3	1160	10.25	44.6	6.66	12.8	1220	12.04	46.9	6.56	11.8	1225	11.93	47.0
10 AVG.	4.42	7.3	983	9.16	37.5	4.20	8.0	1065	10.81	40.6	4.66	8.6	1115	11.26	42.5
15 AVG.	3.43	5.9	916	8.65	34.8	3.33	7.0	996	10.17	37.9	3.55	7.9	995	10.22	37.9
20 AVG.	2.23	4.1	888	8.74	33.5	1.98	4.1	974	10.13	36.7	2.02	3.4	945	9.95	35.6

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX D-11 (Cont'd.)

TABLE 29-2. TRUCK 029 SUMMARY - GRAMS/MINUTE

1975 IHC D2DIE 9.39 Litre V-8 GVW 11413 KG Project 11-4133

Test Desc.	EMPTY LOAD - 7258 KG					HALF LOAD - 9299 KG					FULL LOAD - 11113 KG				
	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.55	1.1	58	0.58	19.24	0.50	0.7	62	0.65	20.17	0.55	0.9	65	0.65	21.24
05 SS	2.08	4.1	216	1.52	71.79	1.90	3.4	210	1.58	69.50	2.10	3.8	227	1.63	75.22
10 SS	2.39	4.7	272	2.04	89.96	2.33	4.4	276	2.19	90.90	2.39	4.4	276	2.17	91.17
15 SS	2.91	5.4	349	2.58	115.04	2.83	5.3	352	2.82	115.86	3.01	5.2	369	2.87	121.09
20 SS	2.83	5.7	388	3.17	127.23	2.76	5.2	384	3.37	125.72	2.97	5.4	409	3.47	133.69
30 SS	2.63	5.2	498	4.66	161.25	2.48	4.7	515	5.15	166.21	2.63	4.3	546	5.26	175.89
40 SS	2.67	5.1	732	7.14	234.75	2.49	4.0	766	7.98	244.50	2.39	3.8	798	8.07	254.21
55 SS	2.43	3.8	1132	12.14	359.12	2.12	2.8	1255	13.60	396.91	1.44	2.0	1370	13.95	431.97
20±5	2.29	3.2	442	4.38	142.46	1.57	3.2	494	4.87	158.00	1.23	2.3	513	5.10	163.28
30±5	2.47	3.5	534	5.66	171.59	2.07	3.8	581	6.01	186.16	2.05	3.1	588	6.20	187.82
40±2	2.87	4.4	760	8.27	243.19	2.52	4.8	826	8.52	263.74	2.76	4.6	832	9.02	265.62
05 AVG.	1.02	1.7	174	1.53	56.24	1.00	1.9	184	1.81	59.59	1.01	1.8	188	1.83	60.88
10 AVG.	1.12	1.8	248	2.31	79.84	1.14	2.2	289	2.93	92.81	1.27	2.3	304	3.07	97.82
15 AVG.	1.36	2.4	364	3.44	116.74	1.31	2.7	392	4.00	125.59	1.42	3.2	398	4.08	127.57
20 AVG.	1.20	2.2	481	4.73	153.03	1.08	2.2	531	5.53	168.71	1.08	1.8	505	5.31	160.15
13-FTP						2.48	4.0	641	5.83	208.98					
13-FTP						2.48	4.2	641	5.80	208.98					

*Fuel Consumption in Grams/Minute

13-FTP - 13-Mode Federal Test Procedure

APPENDIX D-11 (Cont'd.)

TABLE 29-3. TRUCK 029 SUMMARY - GRAMS/KILOGRAM OF FUEL
1975 IHC D2DIE 9.39 Litre V-8 GVW 11413 KG Project 11-4133

Test Desc.	EMPTY LOAD - 7258 KG				HALF LOAD - 9299 KG				FULL LOAD - 11113 KG			
	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	28.48	54.7	3015	29.92	24.94	34.2	3058	32.33	25.89	42.6	3042	30.57
05 SS	29.01	57.3	3009	21.21	27.28	48.3	3029	22.74	27.93	50.0	3024	21.68
10 SS	26.56	52.2	3025	22.72	25.61	48.3	3034	24.10	26.21	48.1	3033	23.83
15 SS	25.30	46.9	3037	22.46	24.44	45.8	3042	24.36	24.84	42.5	3045	23.67
20 SS	22.27	44.5	3050	24.95	21.99	41.4	3056	26.80	22.20	40.6	3057	25.93
30 SS	16.30	32.2	3088	28.93	14.95	28.0	3099	30.98	14.97	24.4	3105	29.89
40 SS	11.36	21.8	3120	30.43	10.18	16.2	3133	32.62	9.40	14.8	3137	31.73
55 SS	6.76	10.6	3152	33.80	5.33	7.1	3162	34.27	3.32	4.6	3172	32.30
20±5	16.06	22.2	3105	30.74	9.92	20.1	3127	30.85	7.56	14.2	3144	31.23
30±5	14.38	20.6	3113	33.00	11.15	20.5	3123	32.28	10.90	16.8	3130	33.03
40±2	11.81	18.0	3125	34.01	9.54	18.4	3131	32.32	10.40	17.2	3131	33.96
05 AVG.	18.08	30.1	3086	27.28	16.84	32.5	3086	30.44	16.55	29.7	3092	30.10
10 AVG.	13.99	23.0	3110	28.98	12.28	23.3	3115	31.61	13.01	23.9	3112	31.42
15 AVG.	11.68	20.3	3122	29.48	10.44	21.8	3123	31.86	11.13	24.8	3116	32.00
20 AVG.	7.87	14.4	3143	30.93	6.39	13.2	3149	32.75	6.72	11.3	3151	33.18

APPENDIX D-11 (Cont'd.)

TABLE 29-4. TRUCK 029 SUMMARY - OPERATING DATA
1975 IHC D2DIE 9.39 Litre V-8 GVW 11413 KG Project 11-4133

	EMPTY LOAD - 7258 KG			HALF LOAD - 9299 KG			FULL LOAD - 11113 KG		
Test Desc.	Test No.	RPM	Rack, %	Test No.	RPM	Rack, %	Test No.	RPM	Rack, %
00 SS	71	600	0.0	41	600	0.0	11	600	0.0
05 SS	72	1700	7.8	42	1600	7.2	12	1680	7.8
10 SS	73	1840	11.1	43	1840	11.7	13	1840	11.1
15 SS	74	2040	17.5	44	2040	17.2	14	2040	17.2
20 SS	75	2040	17.8	45	2040	17.2	15	2040	17.2
30 SS	76	2000	18.0	46	2000	18.3	16	2000	18.3
40 SS	77	2320	27.8	47	2300	27.2	17	2300	27.2
55 SS	78	2320	32.2	48	2320	33.3	18	2320	100.0
		Period			Period			Period	
20±5	81	19.0		51	19.0		21	19.0	
30±5	82	36.0		52	36.0		22	36.0	
40±2	86	60.0		56	60.0		26	60.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX D-12

TABLE 30-1. TRUCK 030 SUMMARY - GRAMS/KILOMETRE

1975 IHC D3DIE 5.21 Litre V-6 GVW 21682 KG Project 11-4133

Test	EMPTY LOAD - 7258 KG					HALF LOAD - 11113 KG					FULL LOAD - 18371 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	9.42	11.5	2132	16.12	81.1	8.80	6.9	2063	14.99	78.2	8.45	11.2	2040	15.03	77.5
10 SS	4.89	6.7	1174	9.21	44.6	4.94	3.7	1185	8.94	44.9	4.57	5.9	1175	8.61	44.6
15 SS	3.55	4.4	946	7.42	35.9	3.62	2.2	971	6.90	36.6	3.55	3.5	996	7.15	37.7
20 SS	2.76	4.0	777	6.40	29.5	2.83	2.3	820	6.42	31.0	2.78	2.0	820	6.42	30.9
30 SS	1.82	2.2	637	6.17	24.0	1.89	1.1	706	6.52	26.5	1.79	1.8	723	6.92	27.2
40 SS	1.75	1.9	713	7.91	26.8	1.83	1.0	826	9.30	31.0	1.83	1.5	880	10.36	33.0
55 SS	1.38	1.1	764	11.89	28.7	1.53	2.8	3160	49.64	37.0	1.79	12.9	1158	18.61	44.0
20±5	2.31	2.8	803	11.90	30.3	1.93	3.9	886	11.03	33.4	2.13	9.6	1125	17.04	40.7
30±5	1.75	2.2	638	8.95	24.1	1.76	2.9	722	9.29	27.2	1.67	5.2	773	11.92	29.2
40±2	1.63	1.7	687	9.51	25.8	1.74	2.5	788	9.83	29.7	1.69	1.7	817	10.87	30.7
05 AVG.	4.77	7.4	1354	14.97	51.3	4.78	5.8	1371	15.51	51.9	5.02	16.8	1490	17.46	57.0
10 AVG.	3.09	4.2	1066	12.65	40.2	3.23	7.8	1135	14.20	43.0	3.38	10.9	1326	17.26	50.3
15 AVG.	2.26	4.2	926	12.21	34.9	2.44	7.9	1036	14.60	39.3	2.59	13.5	1305	19.75	49.6
20 AVG.	2.00	2.8	851	10.26	32.0	2.05	2.8	938	11.98	35.3	2.15	7.5	1133	15.54	42.8

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ±Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX D-12 (Cont'd.)

TABLE 30-2. TRUCK 030 SUMMARY - GRAMS/MINUTE

1975 IHC D3DIE 5.21 Litre V-6 GVW 21682 KG Project 11-4133

Test	EMPTY LOAD - 7258 KG					HALF LOAD - 11113 KG					FULL LOAD - 18371 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.28	0.4	59	0.87	18.93	0.28	0.4	58	0.81	18.81	0.29	0.4	58	0.81	18.82
05 SS	1.36	1.7	309	2.33	98.93	1.20	0.9	282	2.05	90.09	1.22	1.6	295	2.18	94.62
10 SS	1.34	1.8	321	2.52	102.86	1.31	1.0	315	2.37	100.42	1.25	1.6	321	2.36	102.74
15 SS	1.43	1.8	381	2.98	121.60	1.46	0.9	390	2.78	124.25	1.46	1.4	409	2.93	130.21
20 SS	1.44	2.1	406	3.35	129.85	1.50	1.2	435	3.41	138.53	1.45	1.1	429	3.36	136.30
30 SS	1.46	1.8	512	4.96	162.95	1.54	0.9	573	5.30	181.65	1.43	1.4	575	5.52	182.49
40 SS	1.88	2.1	769	8.52	243.79	1.96	1.0	883	9.95	279.32	1.98	1.7	948	11.17	299.99
55 SS	2.03	1.6	1125	17.50	355.55	2.26	4.1	1449	22.76	458.54	2.64	19.0	1705	27.40	546.37
20±5	1.23	1.5	427	6.33	135.83	1.07	2.2	493	6.13	156.52	1.05	4.7	554	8.40	177.15
30±5	1.40	1.7	510	7.15	161.97	1.45	2.4	596	7.66	189.30	1.31	4.1	605	9.33	192.96
40±2	1.74	1.8	730	10.12	231.51	1.92	2.8	866	10.80	274.84	1.77	1.8	856	11.38	270.94
05 AVG.	0.67	1.0	189	2.09	60.38	0.67	0.8	191	2.16	60.88	0.70	2.4	209	2.45	67.35
10 AVG.	0.82	1.1	284	3.37	90.30	0.84	2.0	297	3.72	94.89	0.91	2.9	357	4.65	114.23
15 AVG.	0.92	1.7	377	4.97	119.80	0.96	3.1	410	5.77	130.91	1.03	5.4	518	7.85	166.18
20 AVG.	1.10	1.5	467	5.63	148.11	1.09	1.5	500	6.38	158.47	1.13	3.9	597	8.19	190.25
13-FTP						1.58	7.5	836	11.10	260.39					
13-FTP						1.55	6.8	837	11.29	260.39					

*Fuel Consumption in Grams/Minute

13-FTP - 13-Mode Federal Test Procedure

APPENDIX D-12 (Cont'd.)

TABLE 30-3. TRUCK 030 SUMMARY - GRAMS/KILOGRAM OF FUEL
1975 IHC D3DIE 5.21 Litre V-6 GVW 21682 KG Project 11-4133

Test	EMPTY LOAD - 7258 KG				HALF LOAD - 11113 KG				FULL LOAD - 18371 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	14.83	22.0	3109	45.74	14.83	22.0	3109	43.15	15.52	21.9	3107	43.12
05 SS	13.79	16.8	3121	23.59	13.35	10.5	3132	22.76	12.94	17.1	3123	23.00
10 SS	13.01	17.7	3121	24.50	13.06	9.7	3134	23.62	12.17	15.7	3127	22.93
15 SS	11.74	14.5	3131	24.53	11.72	7.1	3142	22.35	11.20	11.1	3138	22.54
20 SS	11.12	16.2	3130	25.79	10.86	9.0	3142	24.61	10.66	7.7	3145	24.63
30 SS	8.96	10.8	3145	30.44	8.46	4.9	3156	29.19	7.83	7.7	3154	30.22
40 SS	7.72	8.4	3153	34.96	7.02	3.7	3162	35.61	6.58	5.5	3161	37.22
55 SS	5.71	1.6	1125	17.50	4.93	9.0	3160	49.64	4.83	34.7	3120	50.15
20±5	9.06	11.0	3145	46.62	6.85	13.9	3147	39.16	5.94	26.7	3130	47.39
30±5	8.65	10.8	3146	44.13	7.68	12.6	3146	40.48	6.78	21.0	3136	48.36
40±2	7.50	7.7	3154	43.70	6.97	10.1	3152	39.30	6.52	6.7	3159	42.01
05 AVG.	11.02	17.0	3129	34.60	10.93	13.2	3135	35.49	10.46	35.0	3102	36.33
10 AVG.	9.12	12.5	3142	37.28	8.90	21.6	3128	39.15	7.97	25.7	3125	40.69
15 AVG.	7.66	14.4	3144	41.45	7.36	23.8	3130	44.09	6.19	32.4	3120	47.22
20 AVG.	7.40	10.3	3151	38.00	6.88	9.5	3154	40.26	5.96	20.7	3139	43.05

APPENDIX D-12 (Cont'd.)

TABLE 30-4. TRUCK 030 SUMMARY - OPERATING DATA
1975 IHC D3DIE 5.21 Litre V-6 GVW 21682 KG Project 11-4133

	EMPTY LOAD - 7258 KG			HALF LOAD - 11113 KG			FULL LOAD - 18371 KG		
Test Desc.	Test No.	RPM	Rack, %	Test No.	RPM	Rack, %	Test No.	RPM	Rack, %
00 SS	71	520	0	41	520	0	11	520	0
05 SS	72	1760	23.9	42	1600	23.3	12	1680	21.6
10 SS	73	1760	23.9	43	1680	24.4	13	1760	23.9
15 SS	74	1920	27.2	44	1920	26.6	14	1920	27.8
20 SS	75	1840	28.9	45	1920	28.9	15	1840	31.1
30 SS	76	1840	34.4	46	1840	36.6	16	1840	38.9
40 SS	77	2160	47.7	47	2160	51.1	17	2160	54.9
55 SS	78	2160	64.9	48	2160	79.4	18	2200	97.1
		Period			Period			Period	
20±5	81	27.0		51	27.0		21	27.0	
30±5	82	48.0		52	48.0		22	48.0	
40±2	86	84.0		53	84.0		23	84 0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX E

DIESEL BUS RESULTS

E-1 Summarized Results of 1 City Bus
E-2 Summarized Results of 1 Intercity Bus
E-3 Modal Modified 13-Mode Results

APPENDIX E-1

TABLE 31-1. BUS 031 SUMMARY - GRAMS/KILOMETRE

1972 GMC City Bus Detroit Diesel 6V-71N GVW 13835 KG Project 11-4133

Test Desc.	EMPTY LOAD - 9752 KG					HALF LOAD - 11113 KG					FULL LOAD - 13608 KG				
	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	3.29	4.8	771	13.62	30.8	3.43	4.3	749	13.89	29.9	3.08	3.5	771	13.62	30.6
10 SS	2.52	3.4	640	10.66	25.5	2.47	3.4	657	10.86	26.1	2.41	2.7	640	10.66	25.4
15 SS	1.96	3.2	669	10.00	26.5	2.06	3.6	672	10.42	26.7	1.92	2.1	689	10.23	27.2
20 SS	1.81	3.9	759	10.99	30.0	1.78	3.3	748	11.00	29.6	1.67	1.9	759	10.62	29.9
30 SS	1.16	2.2	530	8.01	26.4	1.20	1.8	538	8.12	21.2	1.07	1.1	578	8.17	22.7
40 SS	1.05	1.6	671	9.87	26.4	1.12	1.5	705	10.24	27.7	1.08	0.7	746	10.33	29.2
20±5	1.80	3.3	1030	14.83	42.6	1.84	4.7	1086	16.91	45.0	1.94	6.8	1259	20.07	52.2
30±5	1.21	2.8	597	9.08	24.8	1.04	4.8	600	10.01	25.0	1.00	7.5	717	10.79	29.9
05 AVG.	3.84	10.5	1639	25.45	68.2	4.50	34.5	2178	33.36	91.9	4.41	30.5	2315	34.86	97.2
10 AVG.	2.72	22.6	1492	21.20	62.9	2.56	19.7	1388	21.15	58.4	2.64	16.6	1599	24.64	66.8
15 AVG.	2.17	16.3	1306	19.34	54.8	1.93	14.5	1145	17.27	48.0	1.95	11.6	1304	20.12	54.4
20 AVG.	1.95	11.3	1161	17.90	48.5	1.91	11.6	1150	18.30	48.1	1.87	9.3	1230	19.62	51.2

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ± Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX E-1 (Cont'd.)

TABLE 31-2. BUS 031 SUMMARY - GRAMS/MINUTE

1972 GMC City Bus Detroit Diesel 6V-71N GVW 13835 KG Project 11-4133

Test	EMPTY LOAD - 9752 KG					HALF LOAD - 11113 KG					FULL LOAD - 13608 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.47	0.8	91	1.56	29.34	0.47	0.7	94	1.73	30.35	0.46	0.5	90	1.59	29.02
05 SS	0.50	0.7	118	2.08	37.78	0.52	0.7	114	2.12	36.68	0.47	0.5	118	2.08	37.65
10 SS	0.65	0.9	165	2.74	52.66	0.65	0.9	175	2.88	55.74	0.62	0.7	165	2.74	52.55
15 SS	0.77	1.3	264	3.94	83.99	0.85	1.5	276	4.27	87.89	0.79	0.8	282	4.20	89.66
20 SS	0.96	2.1	403	5.84	128.17	0.96	1.8	403	5.93	128.02	0.89	1.0	403	5.65	127.59
30 SS	0.93	1.8	427	6.44	135.37	0.98	1.5	437	6.60	138.55	0.86	0.9	465	6.57	147.02
40 SS	1.11	1.7	713	10.48	225.26	1.18	1.6	744	10.79	234.78	1.14	0.8	786	10.88	247.58
20±5	0.98	1.8	561	8.08	177.52	0.97	2.5	572	8.90	181.27	1.02	3.5	659	10.50	208.97
30±5	0.98	2.3	482	7.33	153.15	0.82	3.8	474	7.90	151.13	0.79	5.9	567	8.52	181.14
05 AVG.	0.57	1.6	243	3.78	77.50	0.60	4.6	292	4.48	94.41	0.63	4.3	328	4.94	105.53
10 AVG.	0.74	6.1	405	5.76	130.66	0.69	5.3	375	5.71	120.69	0.70	4.4	425	6.55	135.91
15 AVG.	0.85	6.4	513	7.60	164.62	0.77	5.8	455	6.87	146.22	0.76	4.5	507	7.83	161.86
20 AVG.	1.02	5.9	606	9.35	193.83	0.97	5.8	582	9.26	186.12	0.95	4.8	628	10.02	200.09
13-FTP						1.43	4.9	761	12.07	236.20					
13-FTP						1.36	4.4	766	11.66	236.20					

*Fuel Consumption in Grams/Minute

13-FTP - 13-Mode Federal Test Procedure

APPENDIX E-1 (Cont'd.)

TABLE 31-3. BUS 031 SUMMARY - GRAMS/KILOGRAM OF FUEL

1972 GMC City Bus   Detroit Diesel 6V-71N   GVW 13835 KG   Project 11-4133

Test Desc.	EMPTY LOAD - 9752 KG				HALF LOAD - 11113 KG				FULL LOAD - 13608 KG			
	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	15.90	28.3	3099	53.19	15.38	22.8	3109	57.13	15.97	18.9	3113	54.92
05 SS	13.32	19.3	3121	55.10	14.30	18.1	3120	57.90	12.51	14.1	3132	55.29
10 SS	12.33	16.6	3128	52.12	11.75	16.2	3131	51.73	11.82	13.3	3135	52.23
15 SS	9.19	15.3	3140	46.94	9.63	16.6	3137	48.62	8.78	9.5	3151	46.80
20 SS	7.48	16.2	3144	45.55	7.49	13.9	3148	46.33	6.95	8.1	3159	44.30
30 SS	6.87	13.0	3151	47.58	7.05	10.8	3154	47.62	5.88	6.0	3165	44.69
40 SS	4.93	7.8	3165	46.54	5.04	6.6	3167	45.97	4.59	3.1	3174	43.95
20± 5	5.53	10.2	3160	45.52	5.36	13.7	3155	49.12	4.86	17.0	3151	50.26
30± 5	6.41	14.7	3150	47.88	5.45	25.2	3136	52.28	4.34	32.8	3128	47.06
05 AVG.	7.35	20.0	3139	48.74	6.40	49.0	3096	47.42	5.93	41.0	3110	46.84
10 AVG.	5.65	47.0	3102	44.06	5.73	44.1	3106	47.34	5.16	32.4	3126	48.16
15 AVG.	5.16	38.9	3116	46.14	5.25	39.5	3115	46.98	4.68	28.0	3135	48.37
20 AVG.	5.25	30.6	3129	48.23	5.19	31.4	3128	49.76	4.77	23.9	3141	50.09

APPENDIX E-1 (Cont'd.)

TABLE 31-4. BUS 031 SUMMARY - OPERATING DATA

1972 GMC City Bus   Detroit Diesel 6V-71N   GVW 13835 KG   Project 11-4133

	EMPTY LOAD - 9752 KG			HALF LOAD - 11113 KG			FULL LOAD - 13608 KG		
Test Desc.	Test No.	RPM	Rack, %	Test No.	RPM	Rack, %	Test No.	RPM	Rack, %
00 SS	71	550	0	41	550	0	11	550	0
05 SS	72	520	16.7	42	520	16.1	12	520	20.5
10 SS	73	680	40.5	43	720	40.0	13	700	40.5
15 SS	74	900	43.3	44	960	43.3	14	940	44.4
20 SS	75	1130	46.6	45	1200	46.6	15	1160	47.7
30 SS	76	1140	48.9	46	1160	50.0	16	1160	53.3
40 SS	77	1540	57.7	47	1540	60.5	17	1550	64.4
		Period			Period			Period	
20±5	81	25.0		51	25.0		21	25.0	
30±5	82	44.0		52	44.0		22	44.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX E-2

TABLE 32-1. BUS 032 SUMMARY - GRAMS/KILOMETRE

1975 MCI MC-5B Bus   Detroit Diesel 8V-71N   GVW 13699 KG   Project 11-4133

Test	EMPTY LOAD - 9752 KG					HALF LOAD - 11113 KG					FULL LOAD - 13608 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 SS	3.50	5.7	937	13.28	35.6	3.44	5.7	1044	14.36	39.6	3.43	5.5	1008	13.12	38.2
10 SS	4.21	9.2	1365	13.14	51.8	4.45	7.7	1363	12.65	51.7	3.84	8.2	1323	11.11	50.1
15 SS	2.13	3.3	819	9.05	30.9	2.24	3.7	769	8.24	29.1	1.98	2.9	771	8.06	29.1
20 SS	2.33	4.1	866	8.57	32.7	2.22	4.6	876	8.41	33.1	1.97	3.2	854	7.86	32.2
30 SS	1.25	1.7	616	6.93	23.2	1.33	1.9	627	7.05	23.6	1.42	2.0	670	7.33	25.2
40 SS	1.52	2.0	733	7.54	27.5	1.39	1.9	770	7.90	28.9	1.60	1.7	803	8.18	30.2
20±5	1.42	2.0	1073	17.49	40.2	1.74	1.9	1159	18.42	43.4	1.96	2.4	1365	21.90	51.1
30±5	0.97	1.3	650	11.28	24.4	1.12	1.1	723	12.06	27.1	-	-	-	-	-
05 AVG.	4.19	7.3	1947	24.84	73.3	4.63	6.0	2025	27.60	76.2	3.74	6.7	2061	29.16	77.5
10 AVG.	3.00	7.8	1518	20.91	57.3	3.08	8.0	1491	22.53	56.3	2.89	9.8	1720	23.64	64.9
15 AVG.	2.16	5.3	1229	17.46	46.3	2.35	7.1	1314	17.91	49.6	2.35	8.0	1476	20.70	55.6
20 AVG.	1.97	6.2	1120	15.99	42.3	1.85	6.3	1140	16.74	43.0	1.94	8.3	1332	19.86	50.3

*Fuel Consumption in Litre/100 km

XX SS - Steady State at designated speed
XX ± Y - Sinusoidal with designated average speed and amplitude
XX AVG. - Driving Cycle with designated average speed

APPENDIX E-2 (Cont'd.)

TABLE 32-2. BUS 32 SUMMARY - GRAMS/MINUTE

1975 MCI MC-5B Bus Detroit Diesel 8V-71N GVW 13699 KG Project 11-4133

Test	EMPTY LOAD - 9752 KG					HALF LOAD - 11113 KG					FULL LOAD - 13608 KG				
Desc.	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*	HC	CO	CO_2	NO_x	Fuel*
00 SS	0.45	0.6	103	1.55	32.99	0.39	0.5	102	1.54	32.66	0.84	0.6	100	1.52	32.41
05 SS	0.56	0.9	151	2.14	48.27	0.53	0.9	160	2.19	50.98	0.52	0.8	154	2.01	49.22
10 SS	1.12	2.5	362	3.49	115.88	1.22	2.1	373	3.46	119.08	1.05	2.2	362	3.04	115.61
15 SS	0.85	1.3	329	3.64	104.70	0.90	1.5	309	3.31	98.60	0.80	1.2	310	3.24	98.60
20 SS	1.26	2.2	467	4.62	148.67	1.20	2.5	472	4.53	150.38	1.06	1.8	460	4.24	146.21
30 SS	1.02	1.4	500	5.63	158.55	1.08	1.6	510	5.73	161.62	1.15	1.6	539	5.90	170.76
40 SS	1.63	2.1	784	8.07	248.36	1.49	2.1	824	8.45	260.66	1.69	1.8	853	8.69	269.99
20±5	0.78	1.1	587	9.57	185.38	0.95	1.0	633	10.05	199.74	1.08	1.3	755	12.12	238.39
30±5	0.80	1.1	536	9.30	169.30	0.93	0.9	601	10.05	189.78	-	-	-	-	-
05 AVG.	0.60	1.0	278	3.54	88.38	0.64	0.8	282	3.84	89.34	0.53	0.9	292	4.14	92.65
10 AVG.	0.85	2.2	431	5.94	136.97	0.86	2.2	416	6.30	132.48	0.77	2.6	459	6.30	145.95
15 AVG.	0.85	2.1	482	6.84	152.87	0.97	3.0	546	7.44	173.64	0.95	3.2	597	8.37	189.67
20 AVG.	1.07	3.4	608	8.70	193.45	0.99	3.4	608	8.91	193.23	1.01	4.3	691	10.32	219.69
13-FTP						1.41	16.4	1025	16.71	323.89					
13-FTP						1.39	15.2	1022	16.67	323.89					

*Fuel Consumption in Grams/Minute

13-FTP - 13-Mode Federal Test Procedure

APPENDIX E-2 (Cont'd.)

TABLE 32-3. BUS 032 SUMMARY - GRAMS/KILOGRAM OF FUEL

1975 MCI MC-5B Bus Detroit Diesel 8V-71N GVW 13699 KG Project 11-4133

Test	EMPTY LOAD - 9752 KG				HALF LOAD - 11113 KG				FULL LOAD - 13608 KG			
Desc.	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x	HC	CO	CO_2	NO_x
00 SS	13.59	17.9	3119	46.98	11.97	15.4	3128	47.12	26.02	17.7	3081	46.80
05 SS	11.65	19.2	3124	44.25	10.31	17.0	3131	43.05	10.65	17.0	3130	40.73
10 SS	9.65	21.2	3127	30.11	10.23	17.6	3130	29.07	9.09	19.4	3131	26.28
15 SS	8.16	12.6	3145	34.75	9.14	15.0	3138	33.60	8.09	11.7	3146	32.89
20 SS	8.46	15.0	3140	31.07	7.97	16.5	3139	30.15	7.27	12.0	3149	28.97
30 SS	6.42	8.6	3156	35.52	6.66	9.6	3154	35.44	6.71	9.4	3154	34.53
40 SS	6.57	8.5	3156	32.48	5.71	8.0	3160	32.44	6.28	6.7	3160	32.17
20±5	4.21	5.8	3168	51.66	4.75	5.2	3167	50.37	4.55	5.7	3167	50.79
30±5	4.71	6.3	3165	54.90	4.92	5.0	3167	52.89	-	-	-	-
05 AVG.	6.79	11.8	3150	40.20	7.22	9.4	3153	42.99	5.73	10.2	3156	44.67
10 AVG.	6.22	16.1	3145	43.29	6.50	16.8	3143	47.52	5.29	18.0	3145	43.23
15 AVG.	5.55	13.6	3151	44.79	5.61	17.1	3146	42.90	5.02	17.1	3148	44.16
20 AVG.	5.52	17.5	3145	44.91	5.11	17.4	3147	46.17	4.58	19.7	3145	46.92

APPENDIX E-2 (Cont'd.)

TABLE 32-4. BUS 032 SUMMARY - OPERATING DATA

1975 MCI MC-5B Bus Detroit Diesel 8V-71N GVW 13699 KG Project 11-4133

	EMPTY LOAD - 9752 KG			HALF LOAD - 11113 KG			FULL LOAD - 13608 KG		
Test Desc.	Test No.	RPM	Rack, %	Test No.	RPM	Rack, %	Test No.	RPM	Rack, %
00 SS	71	525	0	41	525	0	11	525	0
05 SS	72	600	0	42	650	0	12	650	0
10 SS	73	1260	1.1	43	1280	0.6	13	1280	0
15 SS	74	1000	3.3	44	1000	2.2	14	1000	1.7
20 SS	75	1360	6.7	45	1360	6.1	15	1360	3.3
30 SS	76	1200	11.7	46	1200	12.2	16	1200	14.4
40 SS	77	1600	22.2	47	1600	23.9	17	1600	27.8
		Period			Period			Period	
20±5	81	17.0		51	17.0		21	17.0	
30±5	82	31.0		52	31.0		22	31.0	
05 AVG.	91			61			31		
10 AVG.	92			62			32		
15 AVG.	93			63			33		
20 AVG.	94			64			34		

APPENDIX E-3

TABLE 1. MODIFIED 13-MODE EMISSIONS TEST

BUS 31 TEST 2 02-17-76 1972 GMC CITY BUS DETROIT DIESEL 6V-71N

MODE	ENGINE SPEED RPM	TORQUE LB-FT	POWER BHP	FUEL FLOW LB/MIN	AIR FLOW LB/MIN	EXHAUST FLOW LB/MIN	FUEL AIR RATIO
1	550	0.0	0.0	.05	12.09	12.19	.004
2	1260	16.7	4.0	.17	28.55	28.72	.006
3	1260	145.9	35.0	.28	28.64	28.93	.010
4	1260	300.1	72.0	.47	28.93	29.39	.016
5	1260	433.5	104.0	.63	28.37	29.00	.022
6	1260	575.2	138.0	.88	27.73	28.61	.032
7	550	0.0	0.0	.05	11.82	11.87	.004
8	2100	477.7	191.0	1.27	46.48	47.75	.027
9	2100	357.6	143.0	1.00	45.45	46.45	.022
10	2100	240.1	96.0	.77	45.76	46.53	.017
11	2100	120.0	48.0	.53	45.90	46.43	.012
12	2100	35.0	14.0	.38	46.05	46.44	.008
13	550	0.0	0.0	.05	11.52	11.57	.004

MODE	HC PPM	CO+ PPM	NOX++ PPM	WEIGHTED BHP	BSHC G/HP HR	BSCO+ G/HP HR	BSNO2++ G/HP HR	HUM. GR/LB
1	156	147	209	0.00	R	R	R	101.8
2	140	159	165	.32	13.27	30.08	51.19	101.8
3	144	146	337	2.80	1.57	3.16	12.03	101.8
4	144	132	585	5.76	.78	1.42	10.31	97.2
5	208	263	909	8.32	.77	1.93	10.95	97.2
6	132	2196	770	11.04	.36	11.97	6.90	97.2
7	160	147	196	0.00	R	R	R	101.4
8	320	543	934	15.28	1.06	3.57	10.09	101.4
9	260	166	784	11.44	1.11	1.42	11.00	101.4
10	208	120	491	7.68	1.33	1.53	10.28	96.2
11	180	121	259	3.84	2.30	3.09	10.84	96.2
12	180	122	169	1.12	7.88	10.66	29.25	96.2
13	192	147	169	0.00	R	R	R	97.2

CYCLE COMPOSITE
BSHC = 1.266 GRAM/BHP HR
BSCO+ = 4.297 GRAM/BHP HR
BSNO2++= 10.715 GRAM/BHP HR
BSHC + BSNO2++= 11.981 GRAM/BHP HR
BSFC = .467 LB/BHP HR

+ CONVERTED TO WET BASIS
++ CONVERTED TO WET BASIS,
CORRECTED TO 75 GRAINS OF WATER PER LB. OF DRY AIR
AND CORRECTED TO 85 DEG. F INLET TEMP. PER
FEDERAL REGISTER PARA. 85.974-18

MODE	GRAMS/MINUTE FUEL	HC	CO	CO2	NO2	WEIGHTED GRAMS/MINUTE FUEL	HC	CO	CO2	NO2
1	22.7	.42	.8	89.1	1.8	1.5	.03	.1	6.0	.1
2	75.6	.88	2.0	250.0	3.4	6.0	.07	.2	20.0	.3
3	128.5	.92	1.8	428.9	7.0	10.3	.07	.1	34.3	.6
4	211.7	.93	1.7	673.9	12.4	16.9	.07	.1	53.9	1.0
5	287.3	1.33	3.3	915.7	19.0	23.0	.11	.3	73.3	1.5
6	400.7	.83	27.5	1190.6	15.9	32.1	.07	2.2	95.2	1.3
7	22.7	.42	.8	87.1	1.7	1.5	.03	.1	5.8	.1
8	574.6	3.36	11.4	1803.6	32.1	46.0	.27	.9	144.3	2.6
9	453.6	2.66	3.4	1466.0	26.2	36.3	.21	.3	117.3	2.1
10	347.8	2.13	2.4	1135.2	16.5	27.8	.17	.2	90.8	1.3
11	241.9	1.84	2.5	809.1	8.7	19.4	.15	.2	64.7	.7
12	173.9	1.84	2.5	617.9	5.7	13.9	.15	.2	49.4	.5
13	22.7	.49	.7	85.0	1.4	1.5	.03	.1	5.7	.1

CYCLE COMPOSITE
HC- FID = 1.43 G/MIN
CO- NDIR = 4.84 G/MIN
CO2-NDIR = 760.77 G/MIN
NO2-CL = 12.07 G/MIN
FUEL WT. = 236.20 G/MIN

HP = 67.60

APPENDIX E-3 (Cont'd.)

TABLE 2. MODIFIED 13-MODE EMISSIONS TEST

BUS 32 TEST 1 02-27-76 1975 MCI MC-5B BUS DETROIT DIESEL 8V-71N

MODE	ENGINE SPEED RPM	TORQUE LB-FT	POWER BHP	FUEL FLOW LB/MIN	AIR FLOW LB/MIN	EXHAUST FLOW LB/MIN	FUEL AIR RATIO
1	525	0.0	0.0	.05	14.78	14.83	.003
2	1260	25.0	6.0	.18	37.49	37.67	.005
3	1260	183.4	44.0	.37	35.77	36.14	.010
4	1260	375.1	90.0	.60	36.30	36.90	.017
5	1260	558.5	134.0	.85	35.38	36.23	.024
6	1260	741.9	178.0	1.30	35.49	36.79	.037
7	525	0.0	0.0	.05	14.67	14.72	.003
8	2100	675.3	270.0	1.87	59.36	61.23	.031
9	2100	507.7	203.0	1.43	57.48	58.91	.025
10	2100	337.6	135.0	1.03	56.38	57.41	.018
11	2100	170.1	68.0	.70	58.81	59.51	.012
12	2100	45.0	18.0	.47	59.76	60.23	.008
13	525	0.0	0.0	.05	14.33	14.38	.003

MODE	HC PPM	CO+ PPM	NOX++ PPM	WEIGHTED BHP	BSHC G/HP HR	BSCO+ G/HP HR	BSNO2++ G/HP HR	HUM. GM/LB
1	104	124	152	0.00	M	M	M	57.8
2	120	149	109	.48	9.95	24.53	24.49	57.8
3	124	75	248	3.52	1.34	1.63	8.40	57.8
4	152	73	530	7.20	.82	.78	9.34	53.2
5	176	143	979	10.72	.63	1.02	11.44	53.2
6	184	8860	981	14.24	.50	48.16	8.76	53.2
7	92	98	138	0.00	M	M	M	54.9
8	192	1613	1229	21.60	.57	9.62	12.04	54.9
9	176	143	991	16.24	.67	1.09	12.43	54.9
10	158	72	465	10.80	.89	.81	8.54	51.6
11	144	72	231	5.44	1.66	1.66	8.73	51.6
12	144	74	114	1.44	6.36	6.50	16.44	51.6
13	120	99	120	0.00	M	R	M	55.0

CYCLE COMPOSITE
BSHC = .922 GRAM/BHP HR
BSCO+ = 10.698 GRAM/BHP HR
BSNO2++ = 10.937 GRAM/BHP HR
BSHC + BSNO2++ = 11.860 GRAM/BHP HR
BSFC = .467 LB/BHP HR

\+ CONVERTED TO WET BASIS
++ CONVERTED TO WET BASIS, CORRECTED TO 75 GRAINS OF WATER PER LB. OF DRY AIR AND CORRECTED TO 85 DEG. F INLET TEMP. PER FEDERAL REGISTER PARA. 85.974-18

MODE	GRAMS/MINUTE FUEL	HC	CO	CO2	NO2	WEIGHTED GRAMS/MINUTE FUEL	HC	CO	CO2	NO2
1	22.7	.34	.8	102.1	1.6	1.5	.02	.1	6.8	.1
2	83.2	.99	2.5	321.8	2.9	6.7	.08	.2	25.7	.2
3	166.3	.99	1.2	590.9	6.5	13.3	.08	.1	43.3	.5
4	272.2	1.23	1.2	894.9	14.1	21.8	.10	.1	71.6	1.1
5	385.6	1.40	2.3	1200.5	25.5	30.8	.11	.2	96.0	2.0
6	589.7	1.49	142.9	1651.7	26.0	47.2	.12	11.4	132.1	2.1
7	22.7	.30	.6	99.4	1.5	1.5	.02	.0	6.7	.1
8	846.7	2.59	43.3	2605.8	54.2	67.7	.21	3.5	208.5	4.3
9	650.2	2.28	3.7	2058.2	42.0	52.0	.18	.3	164.7	3.4
10	468.7	2.00	1.8	1455.6	19.2	37.5	.16	.1	116.4	1.5
11	317.5	1.89	1.9	1086.3	9.9	25.4	.15	.2	86.9	.8
12	211.7	1.91	2.0	753.9	4.9	16.9	.15	.2	60.3	.4
13	22.7	.38	.6	95.1	1.2	1.5	.03	.0	6.4	.1

CYCLE COMPOSITE
HC- FID = 1.41 G/MIN
CO- NDIR = 16.35 G/MIN
CO2-NDIR = 1025.43 G/MIN
NO2-CL = 16.71 G/MIN
FUEL WT. = 323.89 G/MIN

HP = 91.68

NOT REPRODUCIBLE